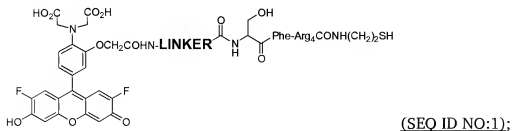
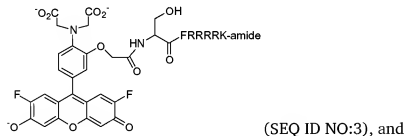
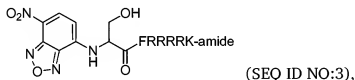


Amendments to the Claims:

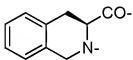
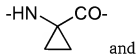
Please cancel Claims 82 and 94 without prejudice or disclaimer; amend Claims 49, 56-62, 71, 73-80, 83-84, 86, 88-89, 98, 122 and 148; and add new Claims 151-154 as set forth below.

1-48. (Canceled)

49. (Currently amended) A substrate for a protein kinase, wherein the substrate is selected from the group consisting of:



wherein F is phenylalanine, K is lysine, and R is arginine; and wherein the LINKER is selected from the group consisting of N-methyl glycine, L-proline, D-proline,



50-55. (Canceled)

56. (Currently amended) A substrate for a protein kinase or a precursor of the substrate, wherein the substrate or the precursor comprises:

a peptide substrate for the protein kinase, wherein the peptide comprises a serine, a threonine, or a tyrosine on a terminal end of the peptide;

at least one fluorophore, wherein a fluorophore is attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide;

wherein ~~the fluorophore is attached directly to the peptide or~~ the fluorophore is attached to the peptide by a linker selected from the group consisting of

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a



b



c



d



e



f



g



h



i



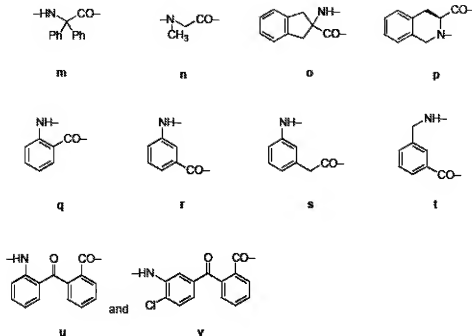
j



k



l

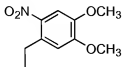


; and

wherein

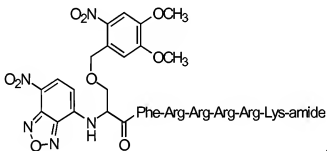
- (i) the substrate is specific for a protein kinase subtype,
- (ii) the fluorophore is attached to the C-terminal end of the peptide,
- (iii) a fluorophore is attached to each terminal end of the peptide,
- (iv) a first fluorophore is attached to a terminal end of the peptide and a second fluorophore, with photophysical properties distinct from the first fluorophore, is attached to any nonterminal site on the peptide,
- (v) the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative, and/or
- (vi) the substrate further comprises a carbohydrate, a lipid or a nucleic acid.

57. (Currently amended) The precursor of the substrate of claim 148, wherein the photolabile side chain comprises the structure



58. (Currently amended) The precursor of the substrate of claim 56, wherein the precursor of the substrate comprises a serine with a photolabile side chain that blocks phosphoryl transfer.

59. (Currently amended) The precursor of a substrate for a protein kinase, where the precursor comprises SEQ ID NO:3 and of claim 56, wherein the substrate has the structure



60. (Currently amended) The substrate or the precursor of the substrate of claim 148, wherein after removal of the photolabile side chain, phosphorylation by a protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% change in fluorescence intensity.

61. (Currently amended) The substrate or the precursor of the substrate of claim 148, wherein after removal of the photolabile side chain, phosphorylation by a protein

kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% increase in fluorescence intensity.

62. (Currently amended) The substrate or the precursor of the substrate of claim 148, wherein after removal of the photolabile side chain, phosphorylation by a protein kinase of the terminal serine, the terminal threonine, or the terminal tyrosine to which the fluorophore is attached produces at least a 20% decrease in fluorescence intensity.

63. (Previously presented) The substrate of claim 60, wherein phosphorylation of the substrate by the protein kinase produces at least a 70% change in fluorescence intensity.

64. (Original) The substrate of claim 63, wherein phosphorylation of the substrate by the protein kinase produces at least a 100% change in fluorescence intensity.

65. (Original) The substrate of claim 64, wherein phosphorylation of the substrate by the protein kinase produces at least a 150% change in fluorescence intensity.

66. (Original) The substrate of claim 65, wherein phosphorylation of the substrate by the protein kinase produces at least a 250% change in fluorescence intensity.

67. (Previously presented) The substrate of claim 56, wherein the substrate is specific for a protein kinase subtype.

68. (Original) The substrate of claim 67, wherein the substrate is specific for protein kinase C.

69. (Original) The substrate of claim 68, wherein the substrate is specific for isoforms α , β , and γ of protein kinase C.

70. (Withdrawn) The substrate of claim 67, wherein the substrate is specific for protein kinase A, protein kinase B, protein kinase D, protein kinase G, Ca^{2+} /calmodulin-dependent protein kinase, mitogen-activated protein kinase, protein kinase mos, protein kinase raf, protein tyrosine kinase, tyrosine kinase abl, tyrosine kinase src, tyrosine kinase yes, tyrosine kinase fps, tyrosine kinase met, cyclin-dependent protein kinase, or cdc2 kinase.

71. (Currently amended) The substrate or the precursor of the substrate of claim 56, wherein the substrate further comprises a carbohydrate, a lipid or a nucleic acid.

72. (Canceled)

73. (Currently amended) The substrate or the precursor of the substrate of claim 56, wherein the fluorophore is attached to the C-terminal end of the peptide.

74. (Currently amended) The substrate or the precursor of the substrate of claim 56, wherein the fluorophore is attached to the N-terminal end of the peptide.

75. (Currently amended) The substrate or the precursor of the substrate of claim 56, wherein a fluorophore is attached to each terminal end of the peptide.

76. (Currently amended) The substrate or the precursor of the substrate of claim

75, wherein fluorophores with distinct photophysical properties are attached to different terminal ends of the peptide.

77. (Currently amended) The substrate or the precursor of the substrate of claim 56, wherein a first fluorophore is attached to a terminal end of the peptide and a second fluorophore, with photophysical properties distinct from the first fluorophore, is attached to any nonterminal site on the peptide.

78. (Currently amended) The substrate or the precursor of the substrate of claim 56, wherein the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative.

79. (Withdrawn and Currently amended) The substrate or the precursor of the substrate of claim 56, wherein the fluorophore comprises a fluorescein group.

80. (Withdrawn and Currently amended) The substrate or the precursor of the substrate of claim 56, wherein the fluorophore comprises a dansyl group, an acridine group, an Alexa Fluor® group, a BODIPY® group, an Oregon Green® group, a Rhodamine Green group, a Rhodamine Red-X group, a Texas Red® group, a Cascade Blue® group, a Cascade Yellow group, a Marina Blue® group, a Pacific Blue group, an AMCA-X group, or a coumarin group.

81-82. (Canceled)

83. (Currently amended) A precursor for a substrate for a protein kinase, wherein the precursor for the substrate comprises:

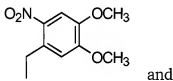
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a peptide comprising a serine, a threonine, or a tyrosine on a terminal end of the peptide;

at least one fluorophore, wherein a fluorophore is attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide; and

a photolabile side chain attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide, wherein the photolabile side chain blocks transfer of a phosphoryl group from adenosine triphosphate to a hydroxyl moiety of the serine, the threonine, or the tyrosine so that the substrate cannot be phosphorylated by a protein kinase until the photolabile side chain is removed from the substrate, and

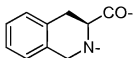
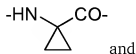
wherein the the photolabile side chain comprises the structure



wherein the fluorophore is attached to the peptide by a linker selected from the group consisting of a carboxamide linker, an aminobenzoic acid linker, a sulfonamide linker, a urea linker, a thiourea linker, an ester linker, a thioester linker, an alkylamine linker, an arylamine linker, an ether linker, and a thioether linker.

84. (Withdrawn and Currently amended) The substrate or the precursor for the substrate of claim 56, wherein the fluorophore is attached to the peptide by a linker selected from the group consisting of N-methyl glycine, L-proline, D-proline,

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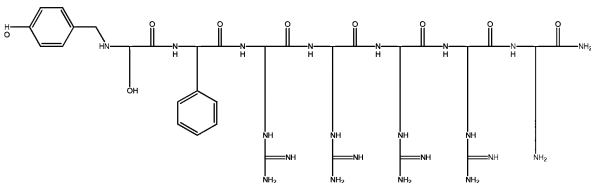


85. (Canceled)

86. (Currently amended) A composition comprising the substrate or the precursor for the substrate of claim 56, and a carrier.

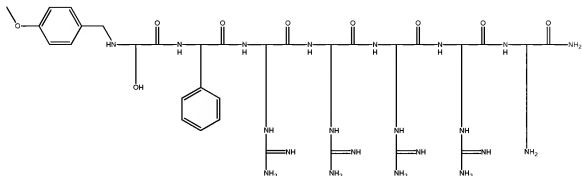
87. (Original) The composition of claim 86, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

88. (Currently amended) A chemical compound comprising SEQ ID NO:3 selected from the group of compounds consisting of:

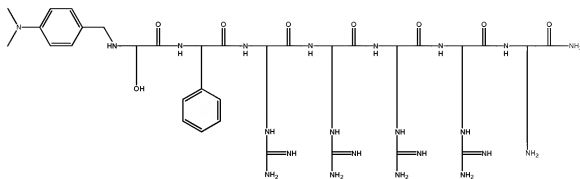


Compound 1

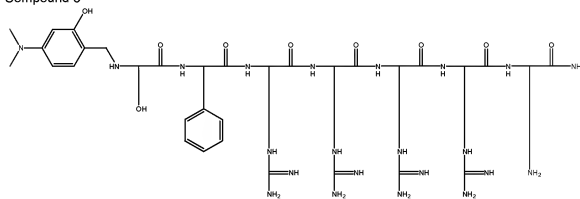
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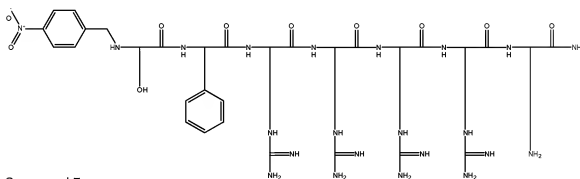
439227.1



Compound 5

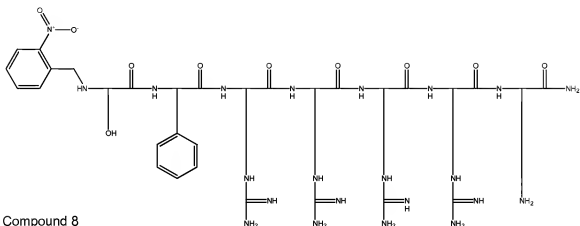


Compound 6

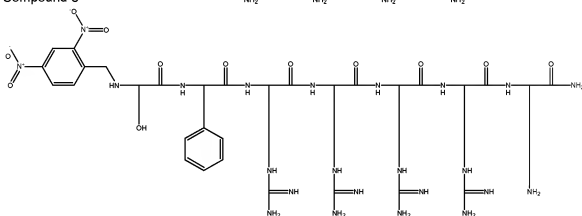


Compound 7

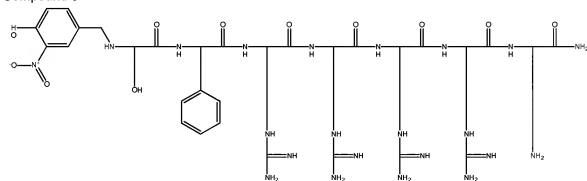
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Compound 8

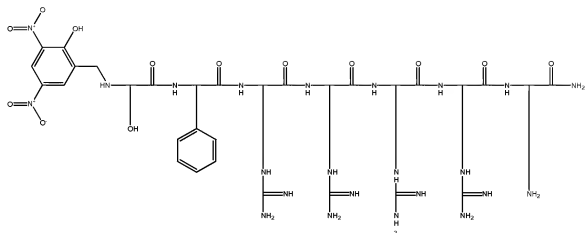


Compound 9

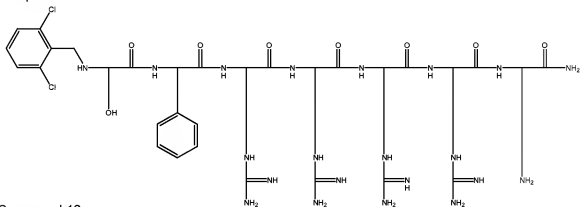


Compound 10

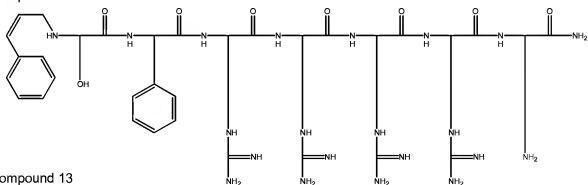
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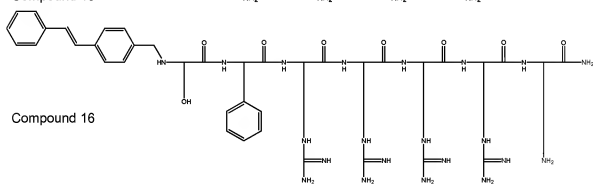
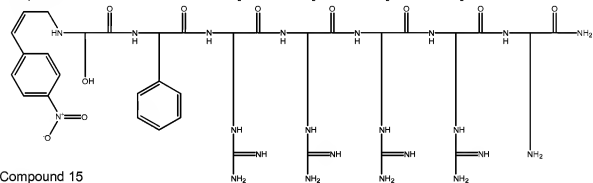
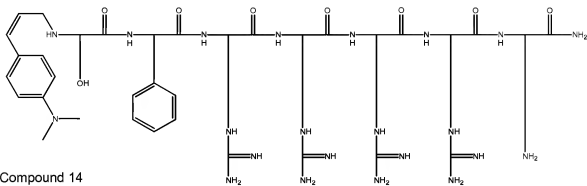
Compound 11



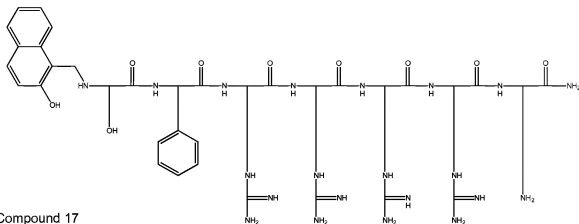
Compound 12



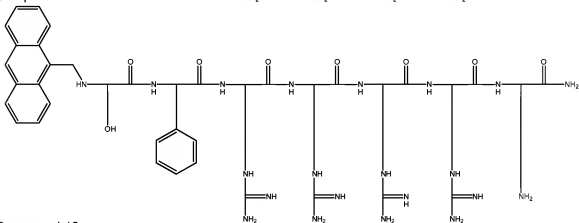
Compound 13



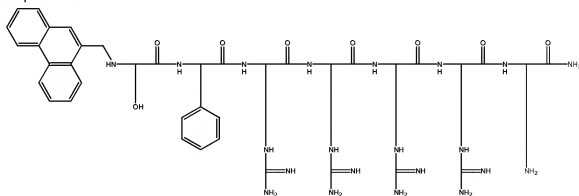
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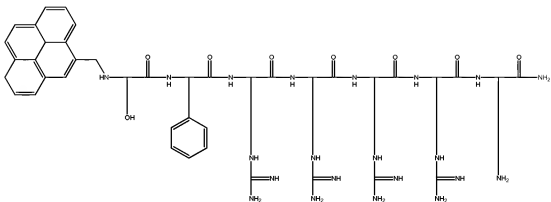
Compound 17



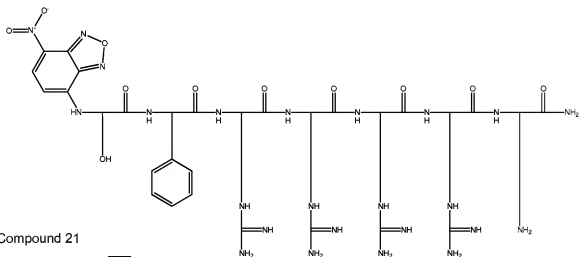
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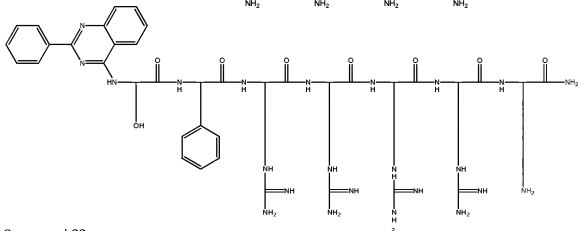
Compound 19



Compound 20

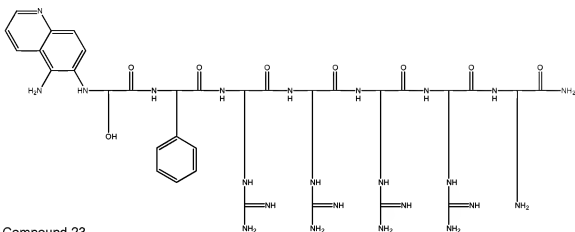


Compound 21

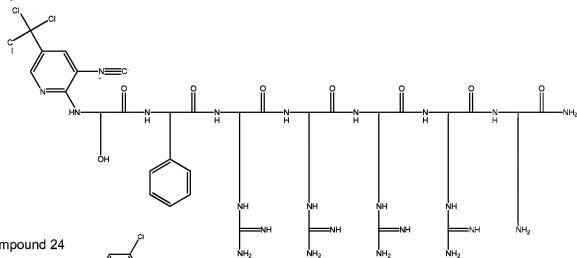


Compound 22

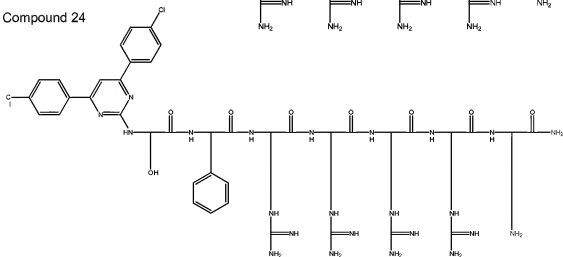
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Compound 23

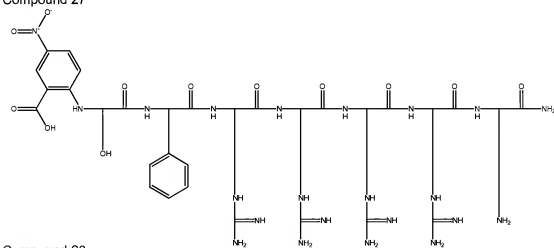
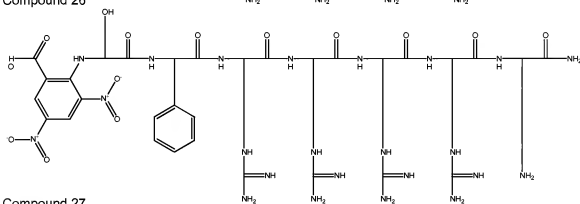
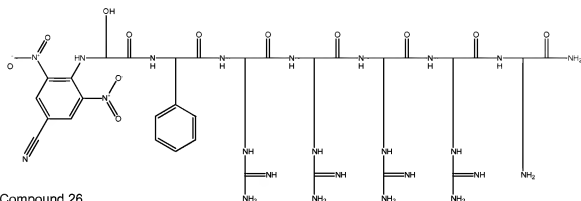


Compound 24

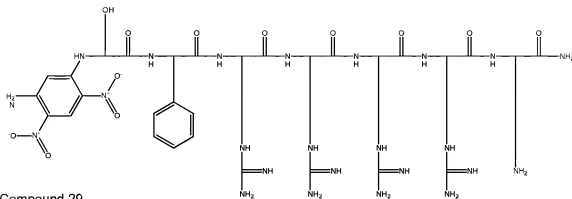


Compound 25

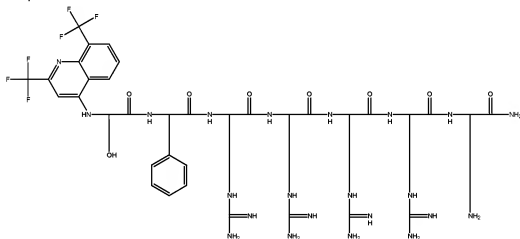
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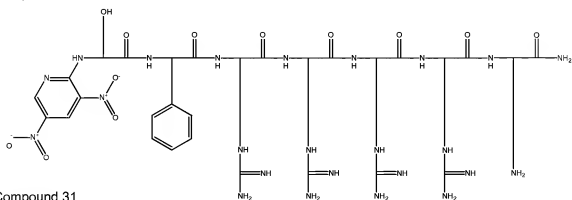
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Compound 29

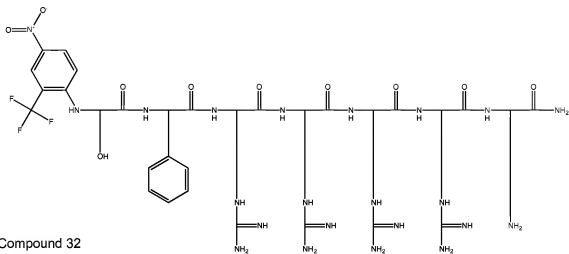


Compound 30

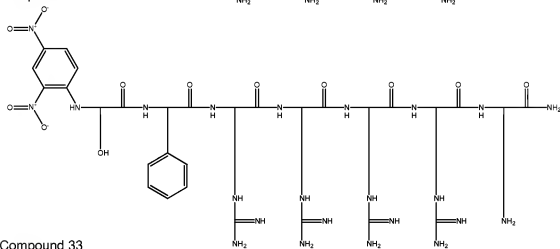


Compound 31

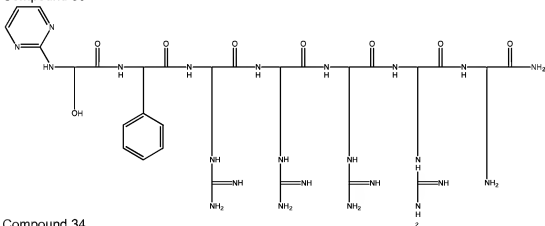
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Compound 32

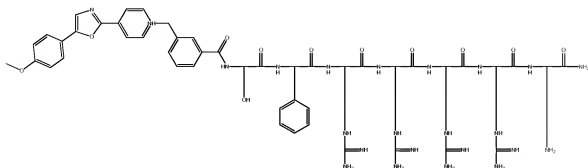


Compound 33

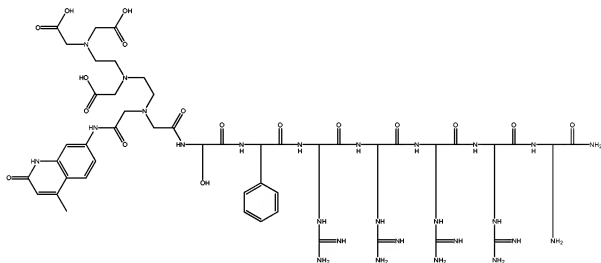


Compound 34

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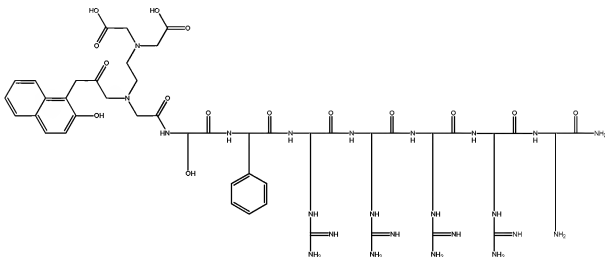


Compound 35

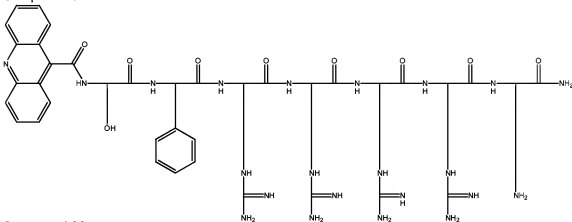


Compound 36

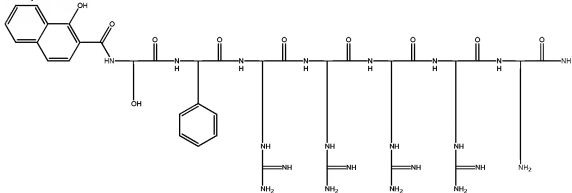
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Compound 37

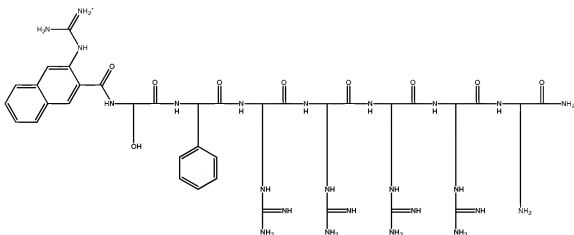


Compound 38

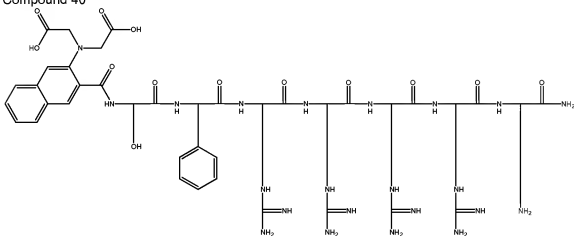


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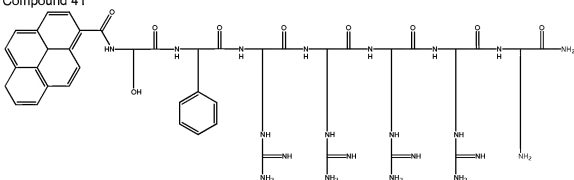
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Compound 40

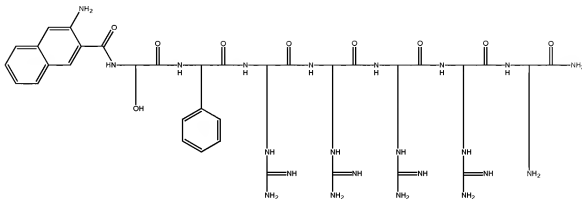


Compound 41

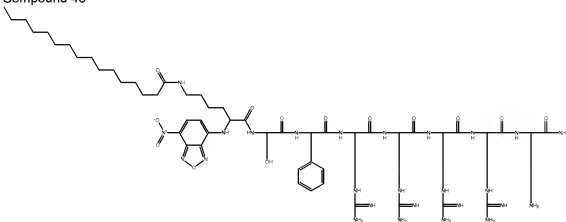


Compound 42

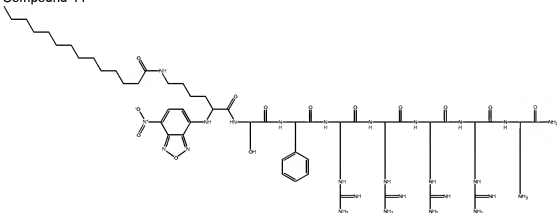
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Compound 43



Compound 44

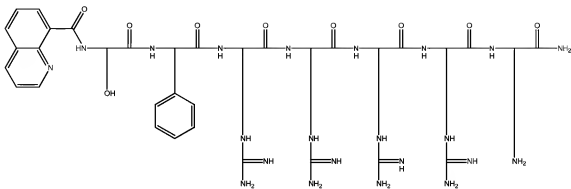


Compound 45

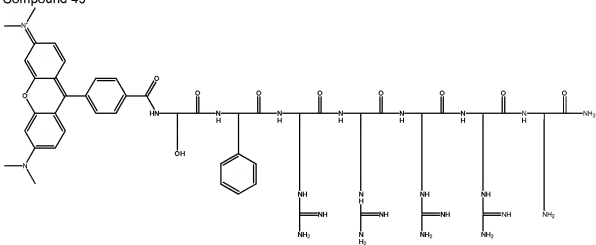
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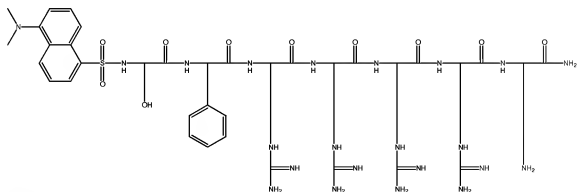
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Compound 49

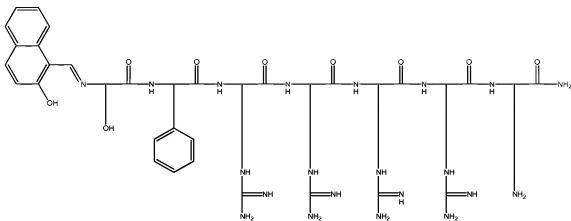


Compound 50

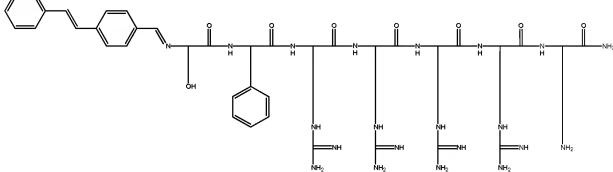


Compound 51

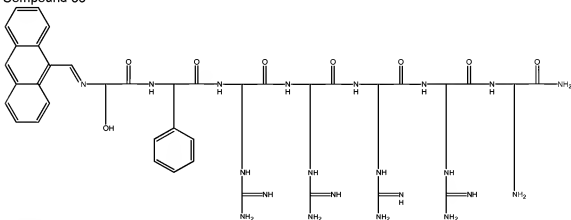
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Compound 52

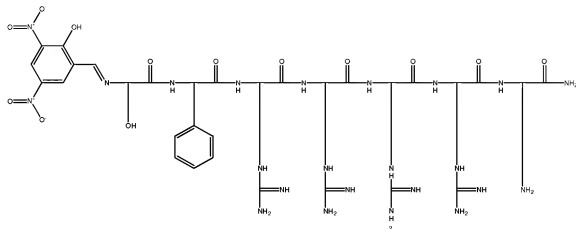


Compound 53

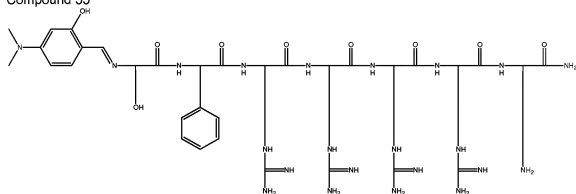


Compound 54

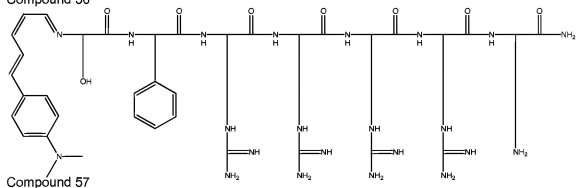
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Compound 55

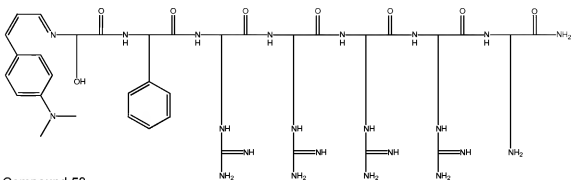


Compound 56

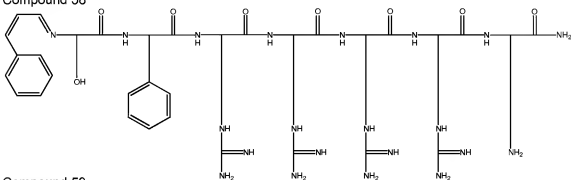


Compound 57

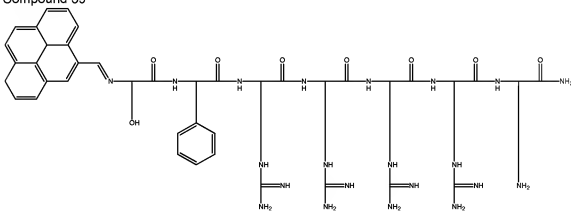
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Compound 58

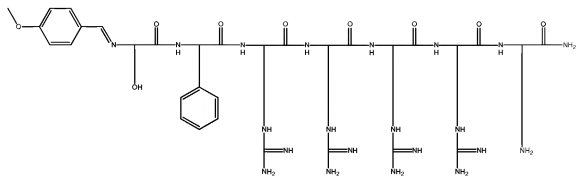


Compound 59

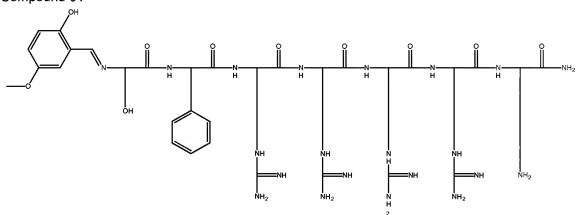


Compound 60

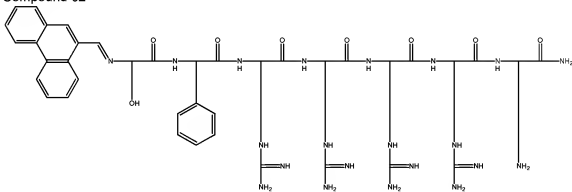
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Compound 61

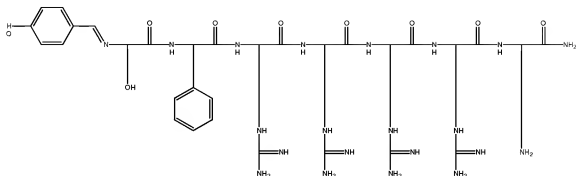


Compound 62

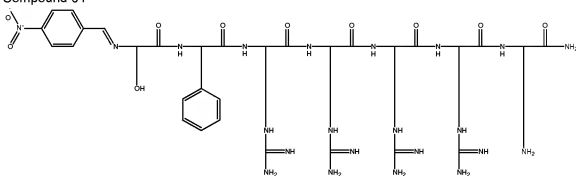


Compound 63

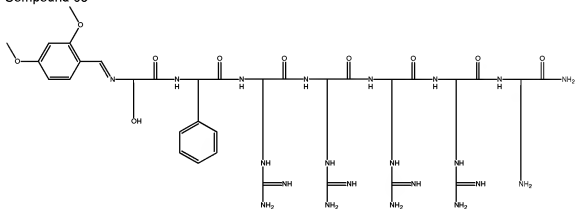
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Compound 64

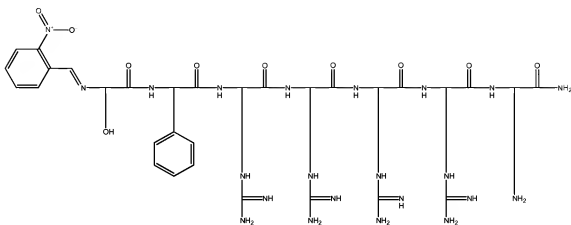


Compound 65

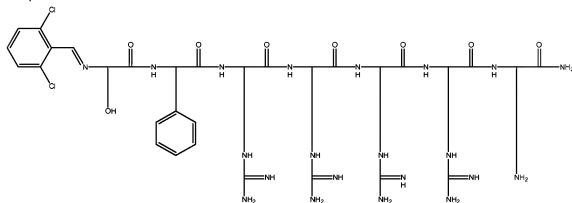


Compound 66

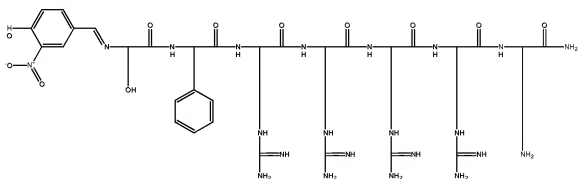
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Compound 67

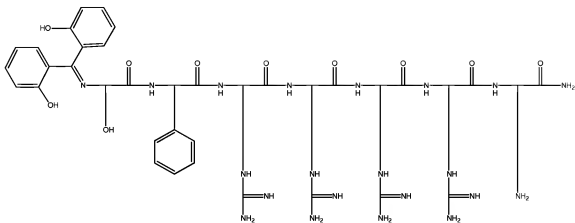


Compound 68

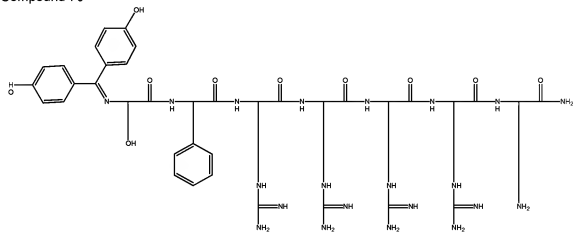


Compound 69

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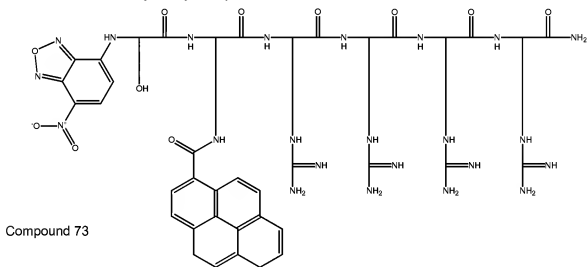
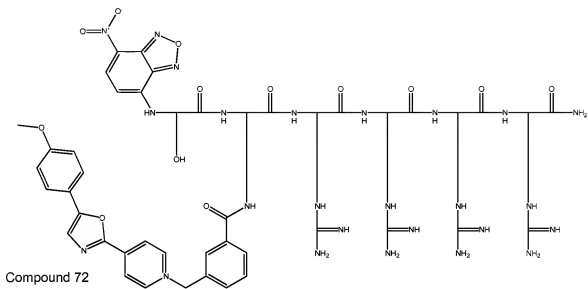


Compound 70

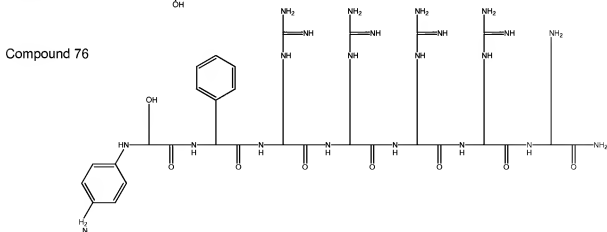
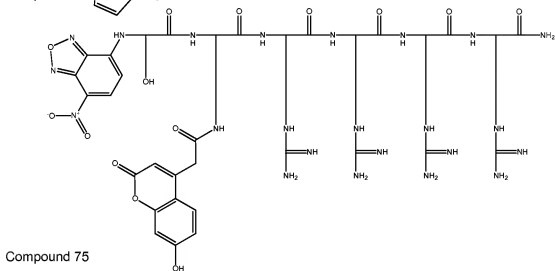
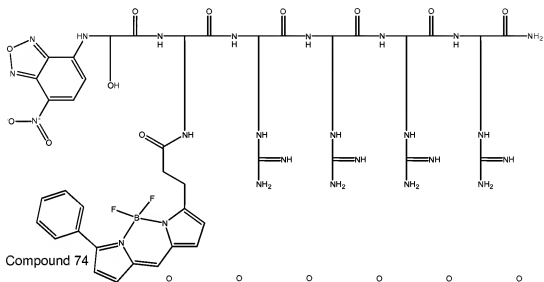


Compound 71

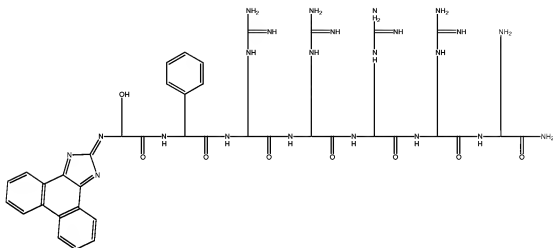
439227.1



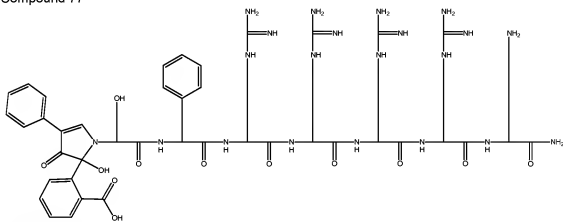
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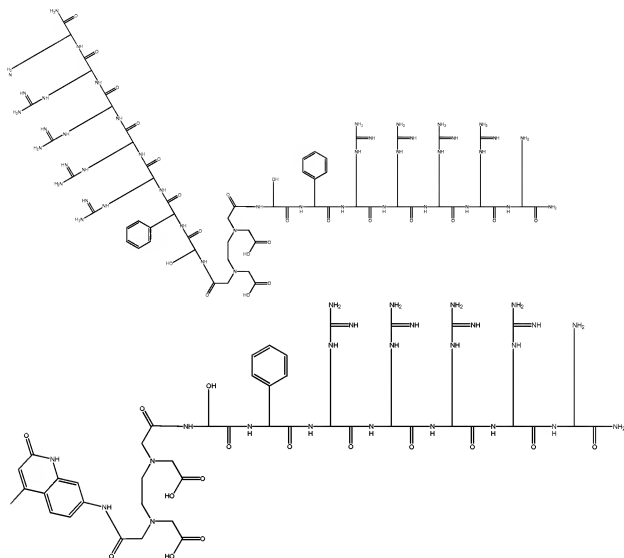
Compound 77



Compound 78

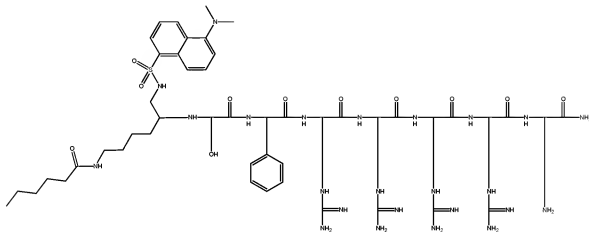
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Compound 79



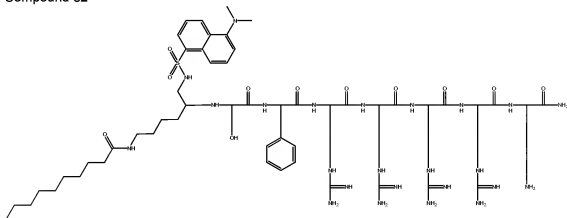
Compound 80

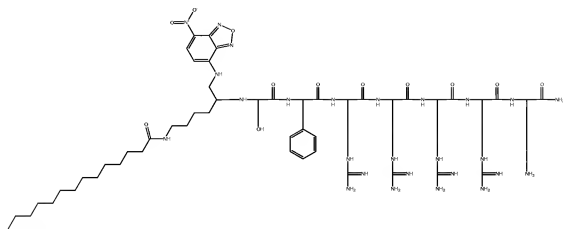
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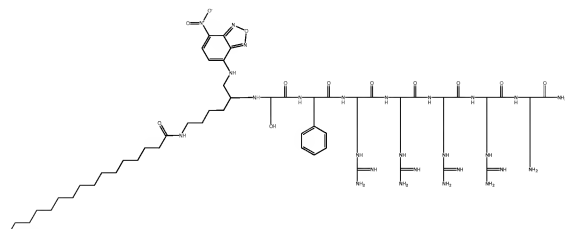
Compound 81

Compound 82

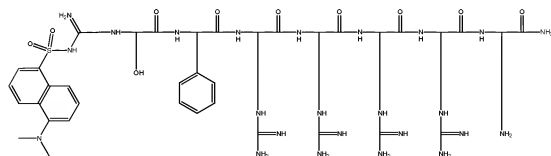




Compound 83

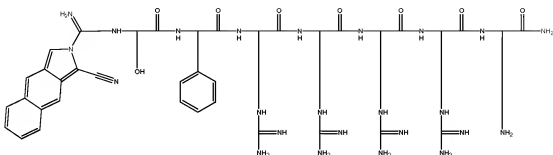


Compound 84

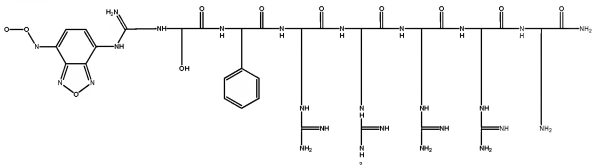


Compound 85

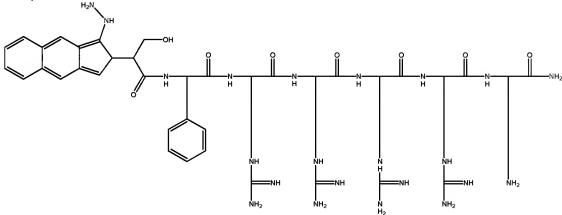
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Compound 86

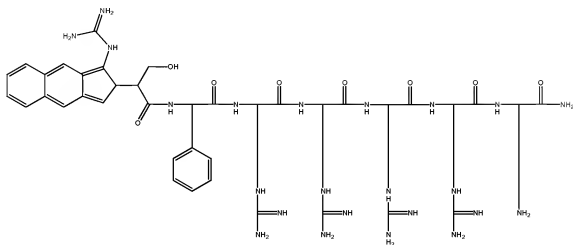


Compound 87

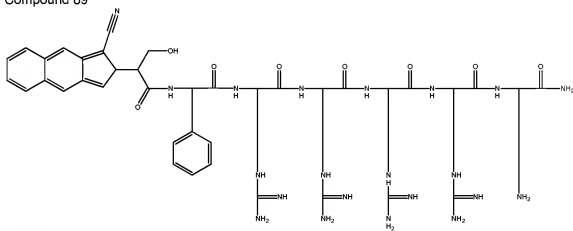


Compound 88

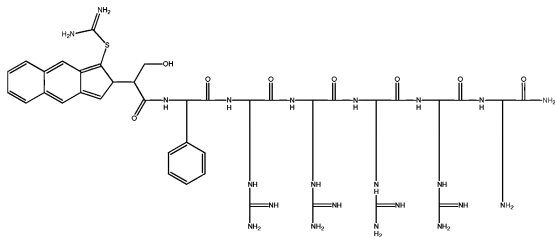
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Compound 89

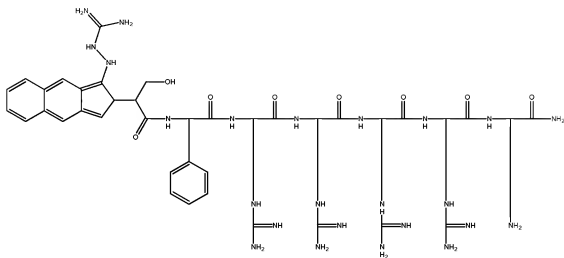


Compound 90

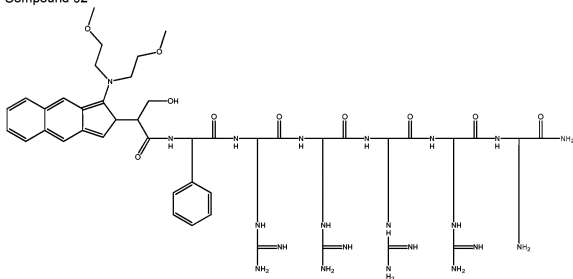


Compound 91

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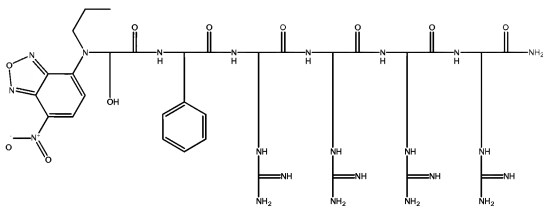


Compound 92

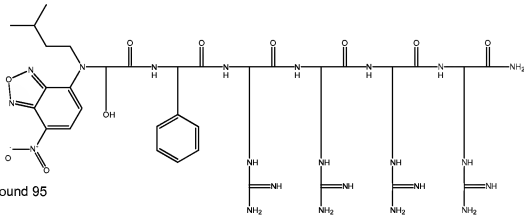


Compound 93

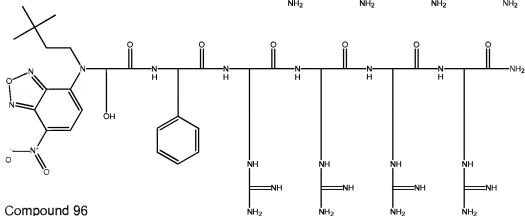
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Compound 94

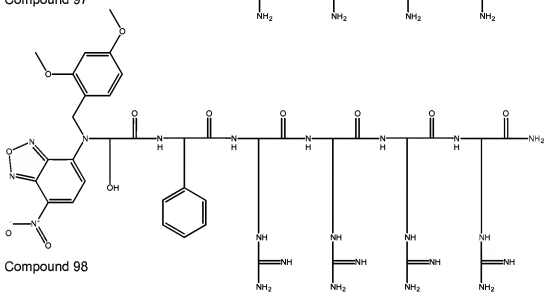
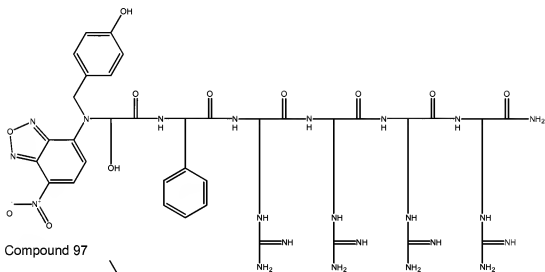


Compound 95

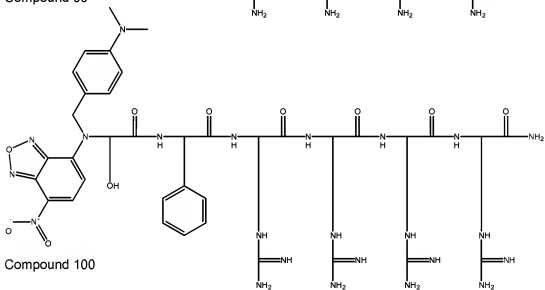
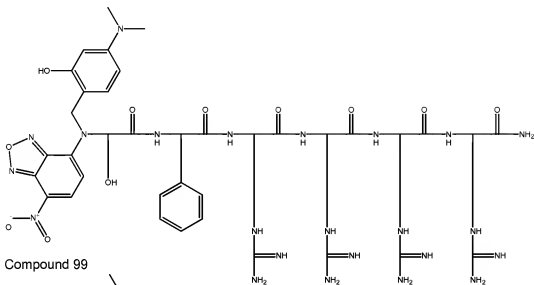


Compound 96

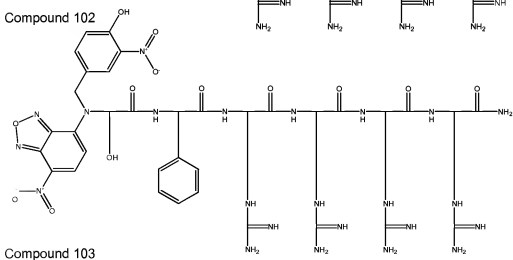
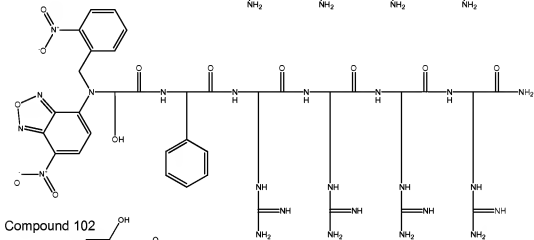
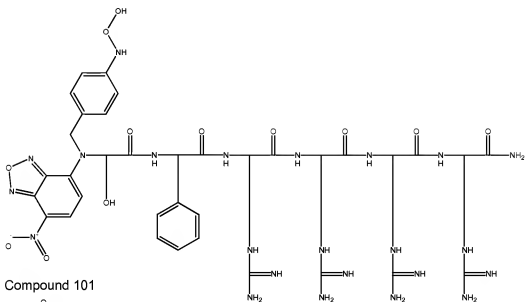
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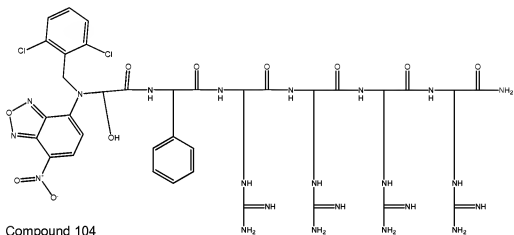
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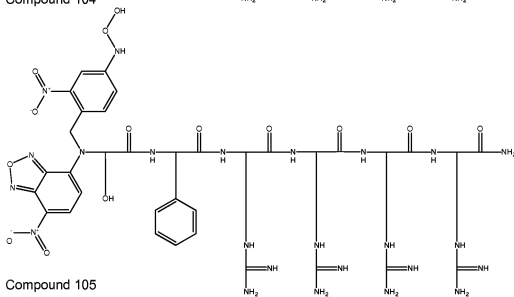
439227.1



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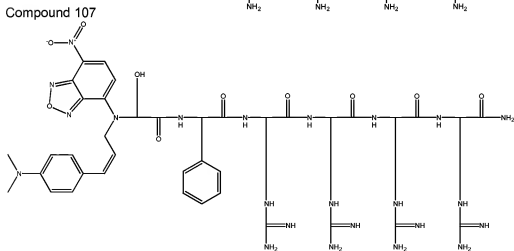
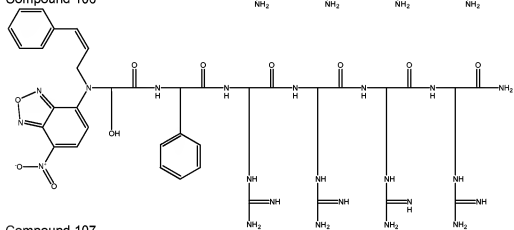
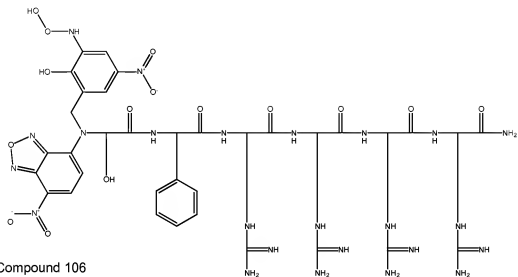


Compound 104

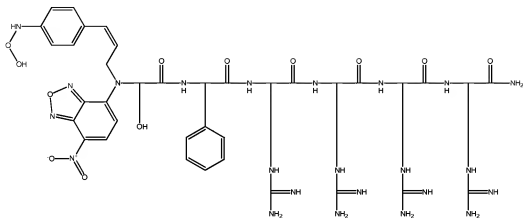


Compound 105

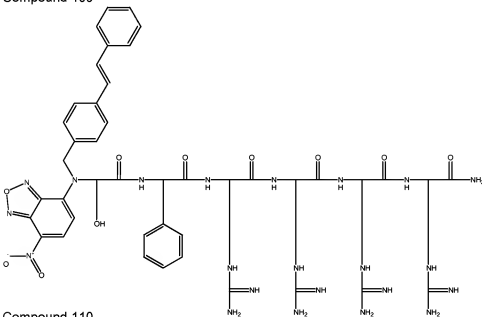
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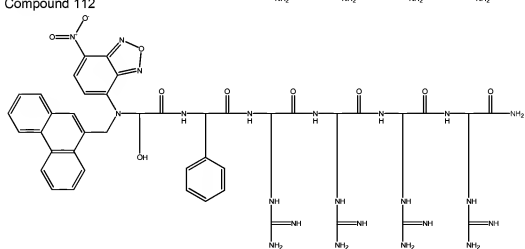
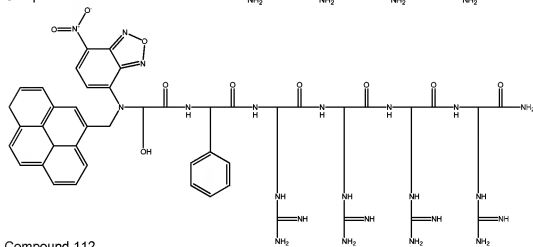
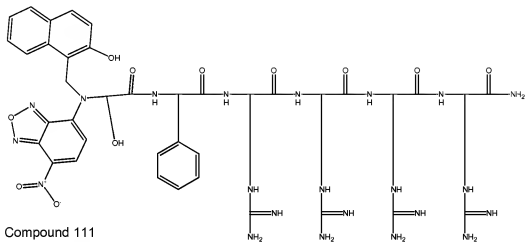


Compound 109

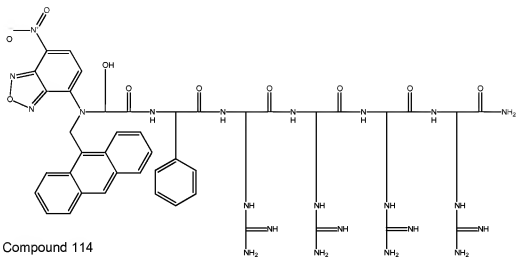


Compound 110

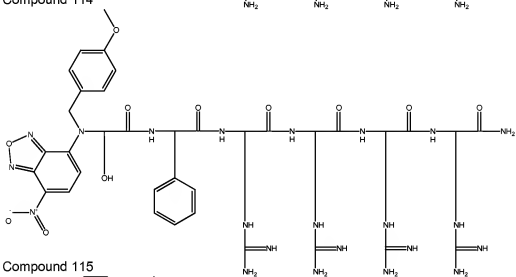
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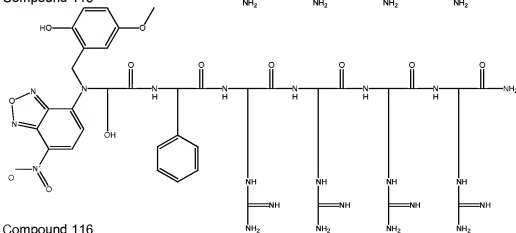
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Compound 114

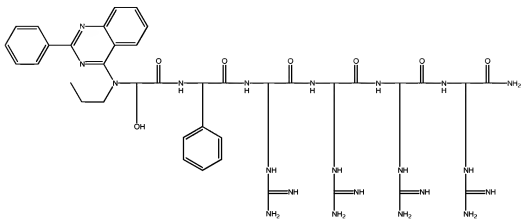


Compound 115

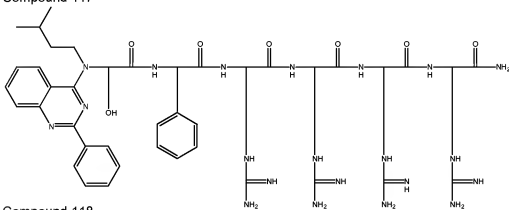


Compound 116

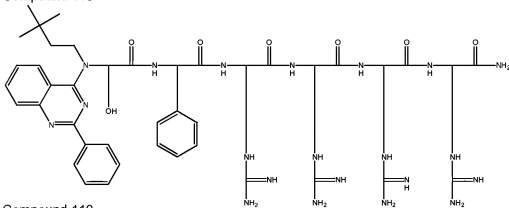
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Compound 117

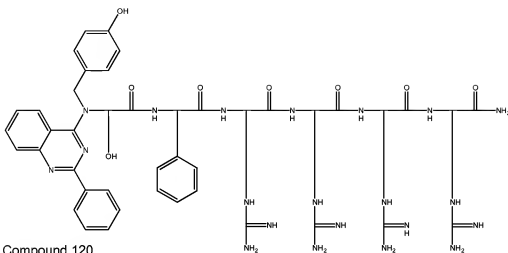


Compound 118

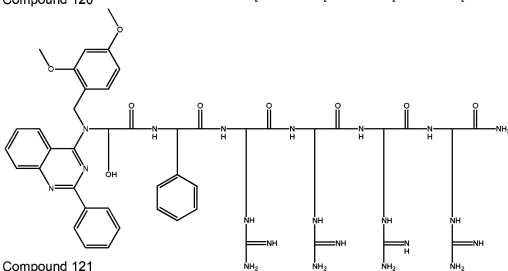


Compound 119

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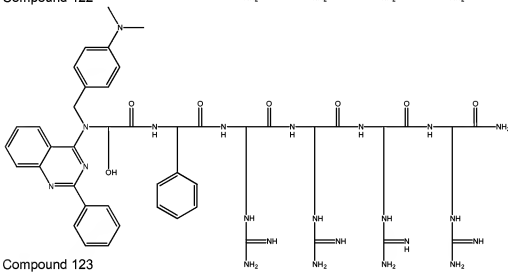
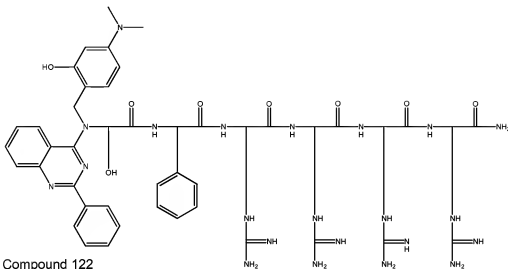


Compound 120

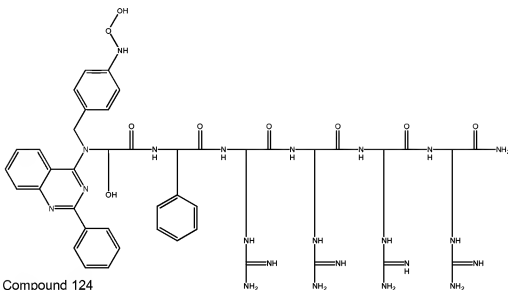


Compound 121

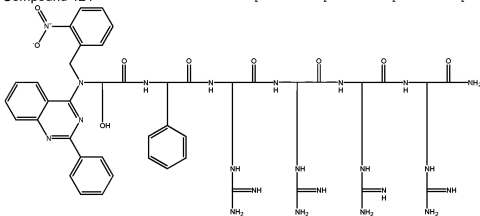
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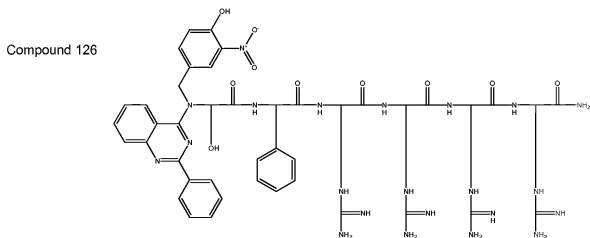
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Compound 124

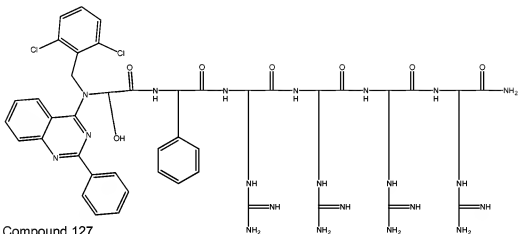


Compound 125

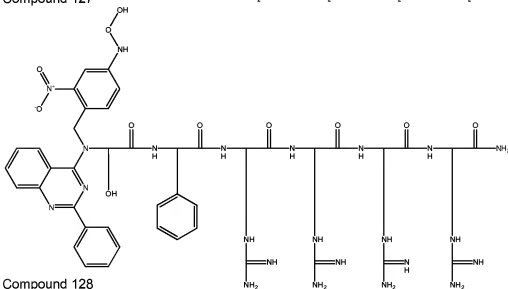


Compound 126

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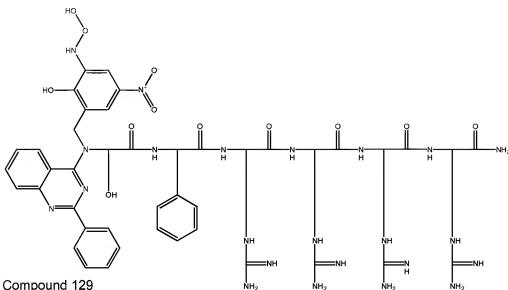


Compound 127

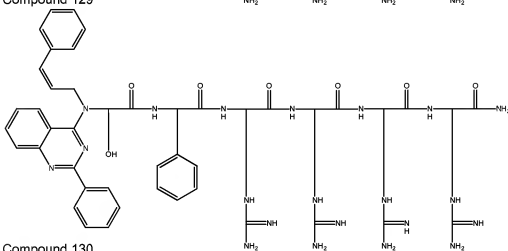


Compound 128

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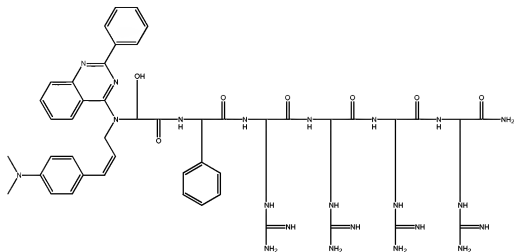


Compound 129

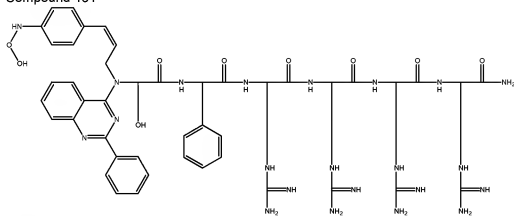


Compound 130

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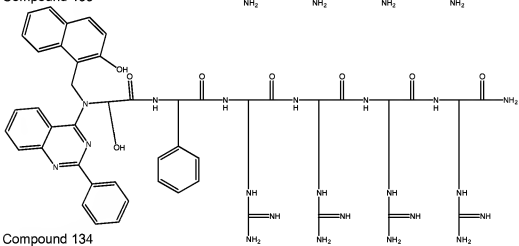
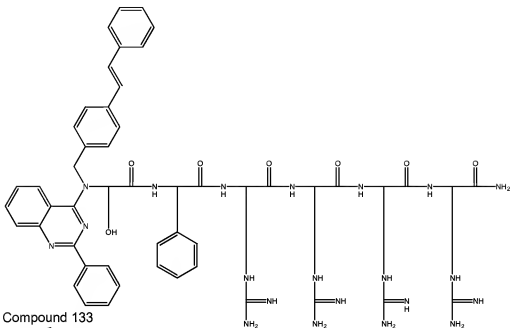


Compound 131

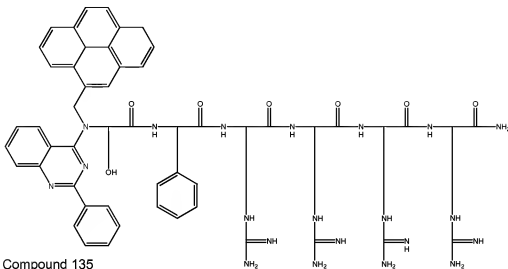


Compound 132

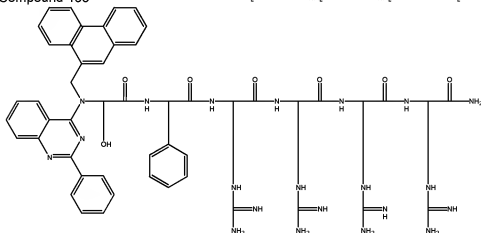
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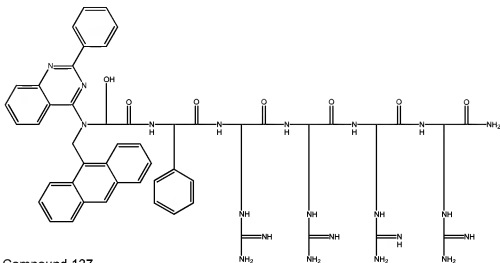


Compound 135

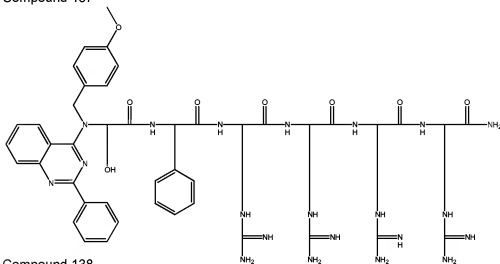


Compound 136

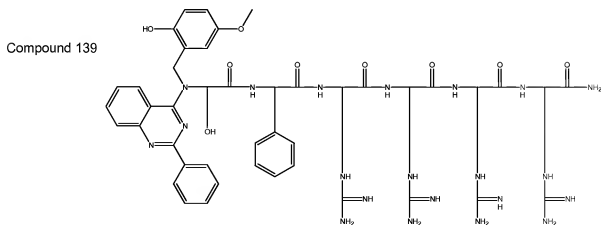
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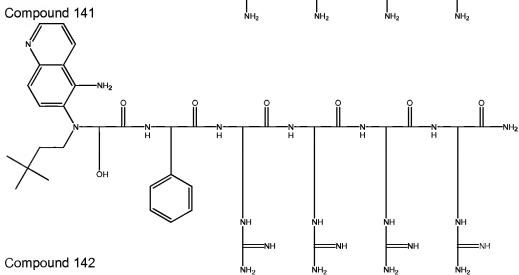
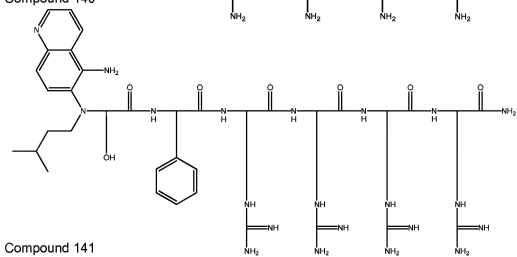
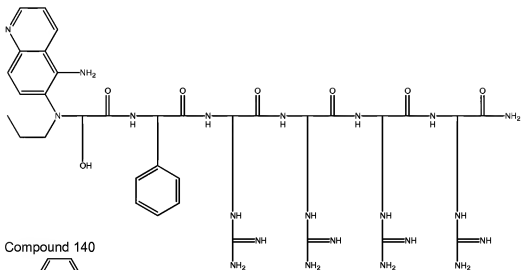
Compound 137



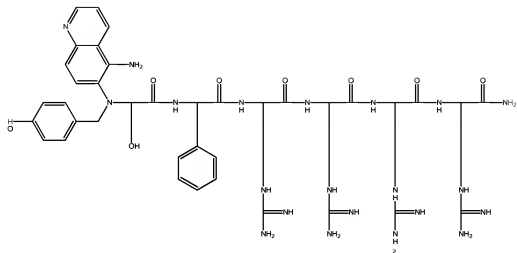
Compound 138



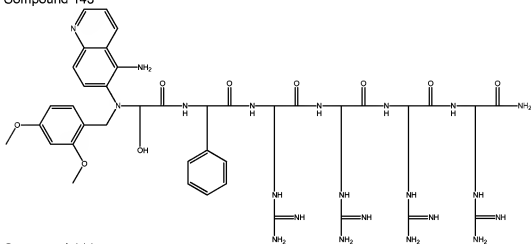
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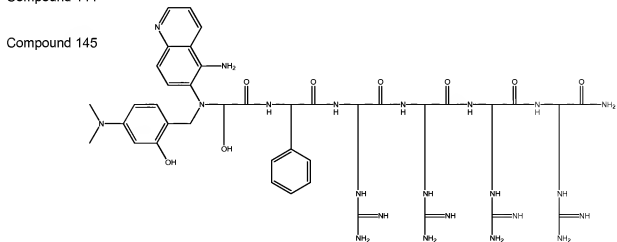
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Compound 143

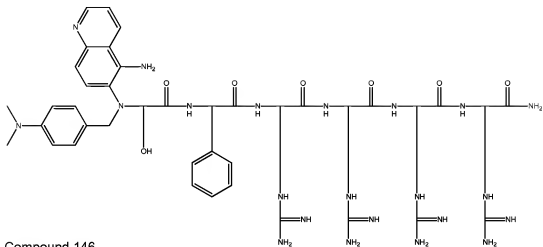


Compound 144

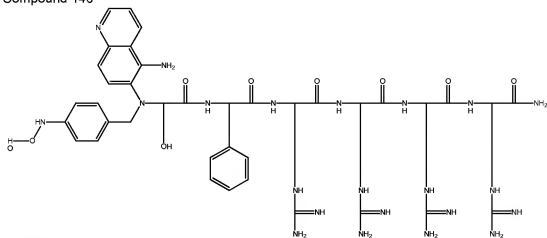


Compound 145

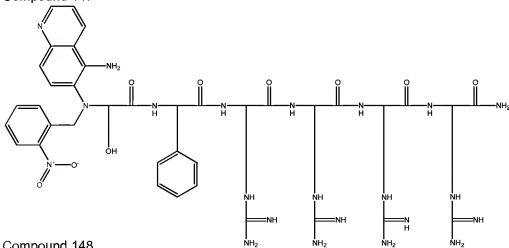
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Compound 146

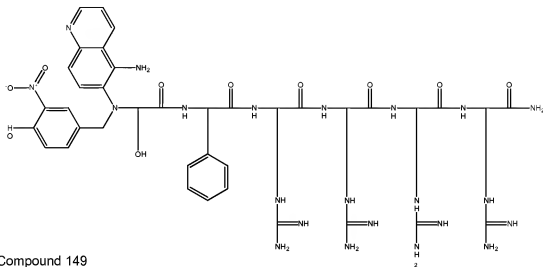


Compound 147

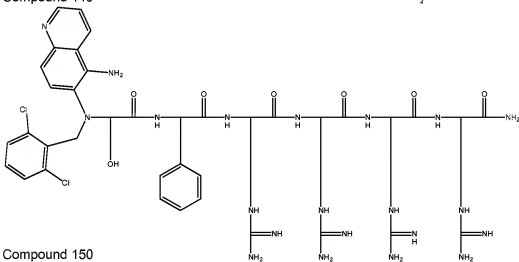


Compound 148

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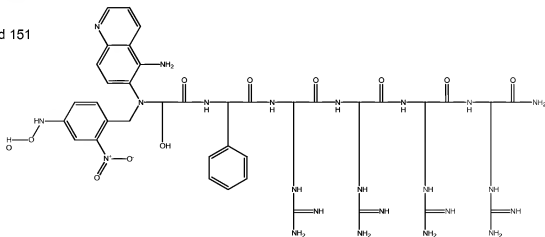


Compound 149

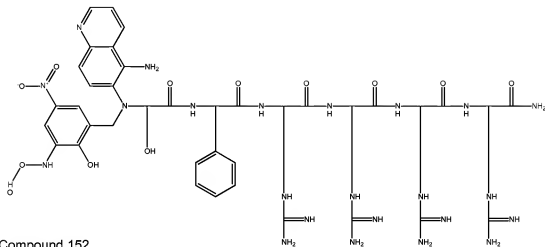


Compound 150

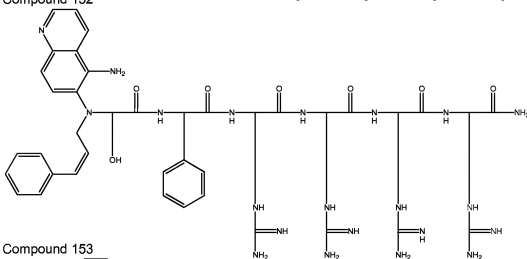
Compound 151



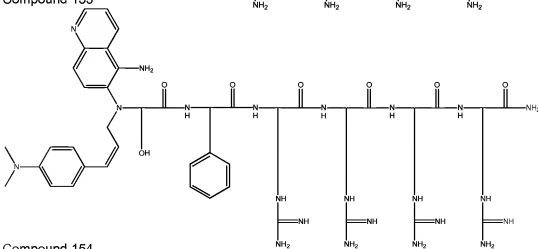
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Compound 152

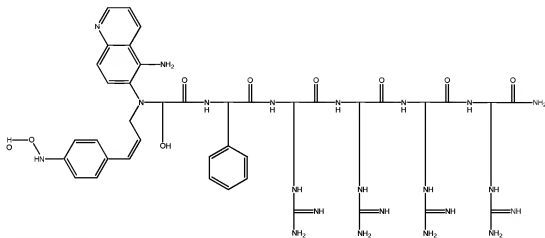


Compound 153

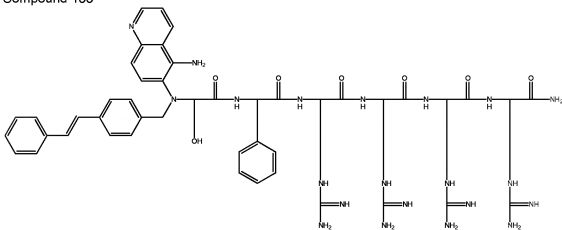


Compound 154

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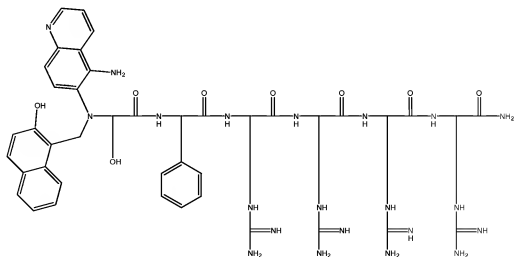


Compound 155

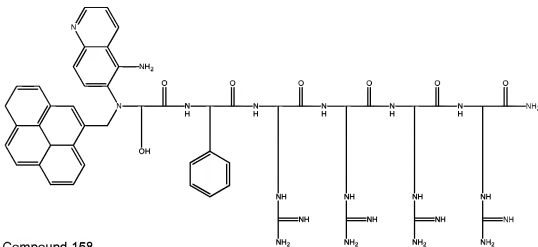


Compound 156

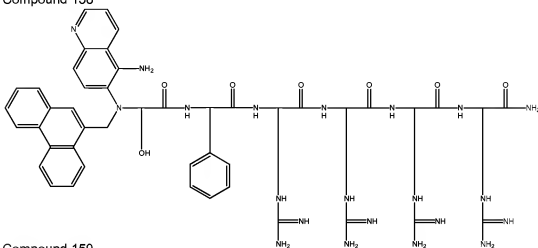
Compound 157



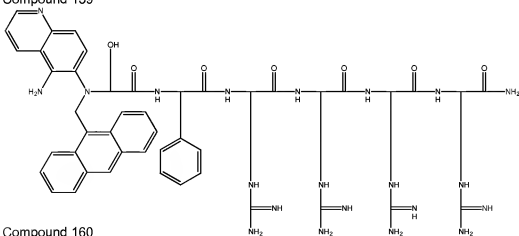
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Compound 158

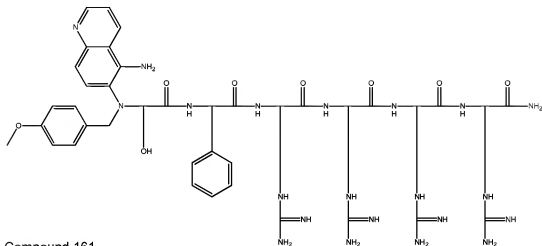


Compound 159

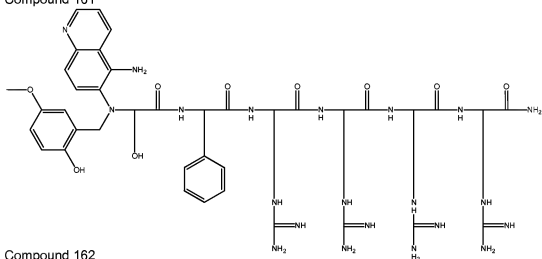


Compound 160

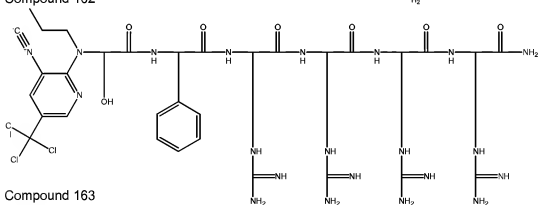
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Compound 161

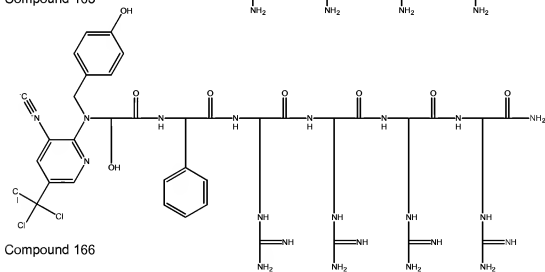
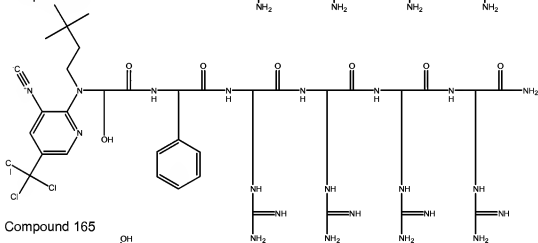
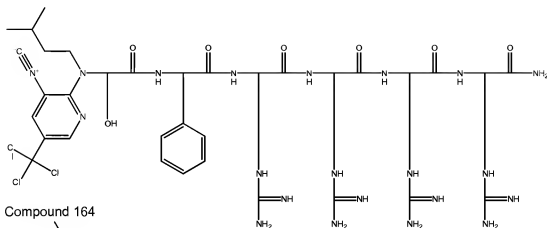


Compound 162

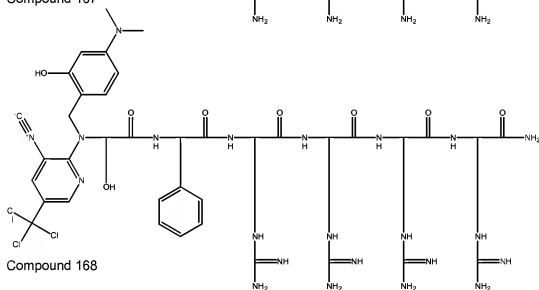
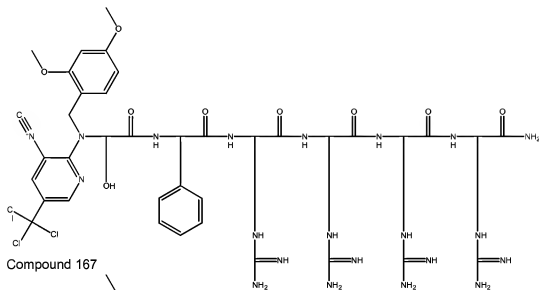


Compound 163

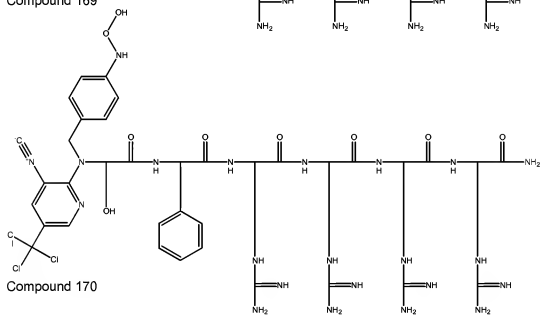
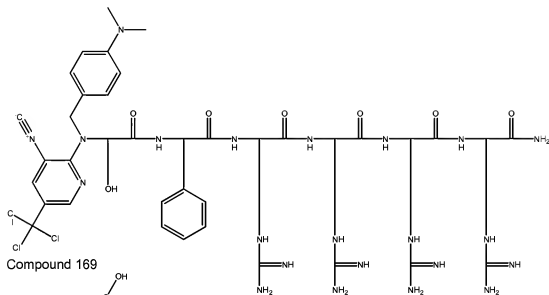
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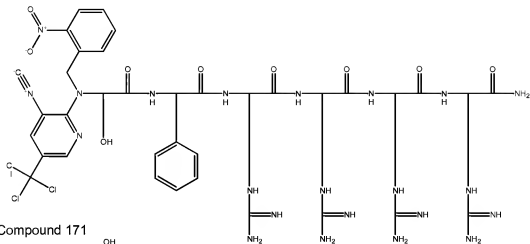
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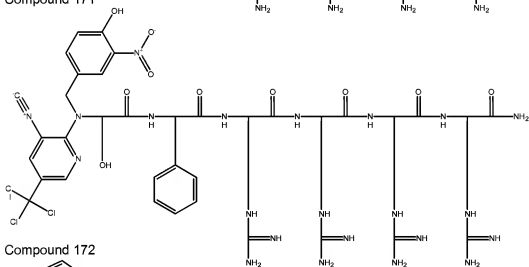
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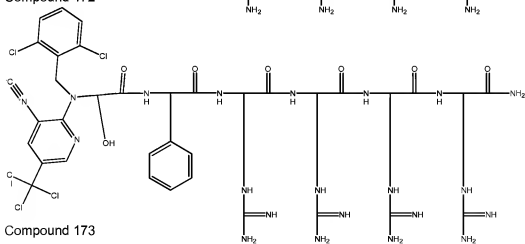
439227.1



Compound 171

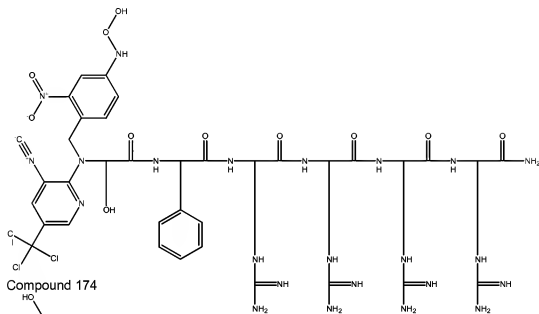


Compound 172

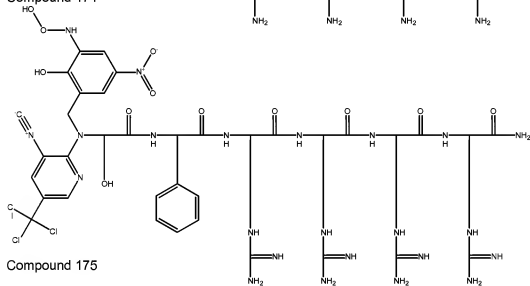


Compound 173

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Compound 174

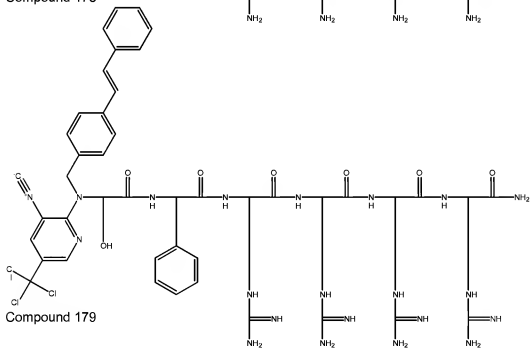
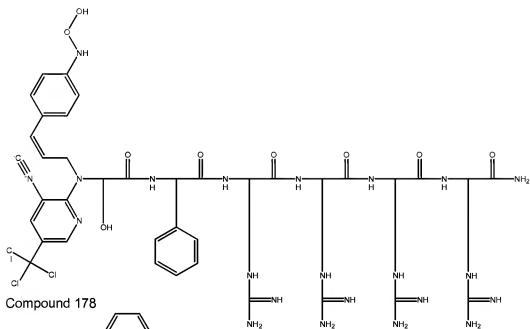


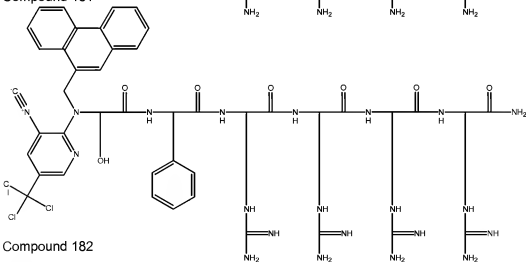
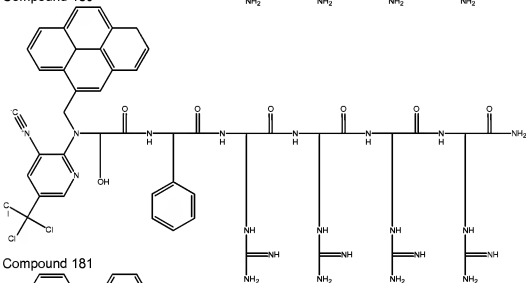
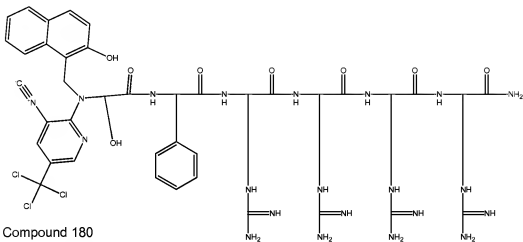
Compound 175

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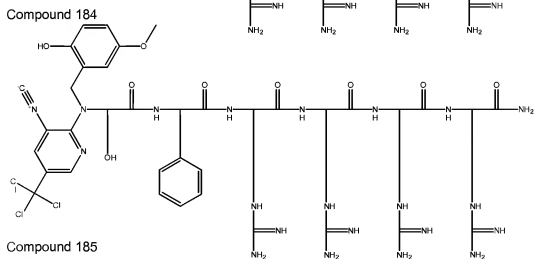
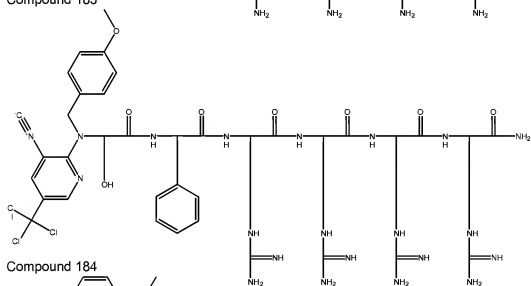
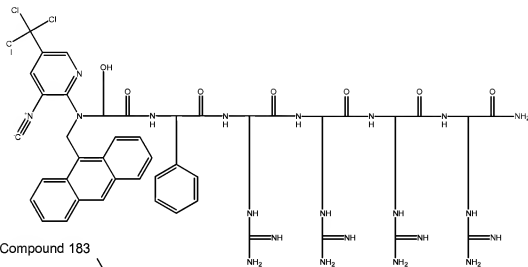


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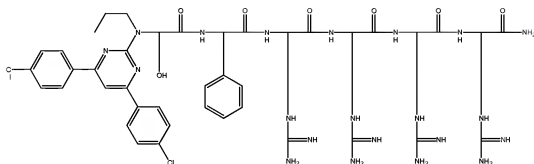




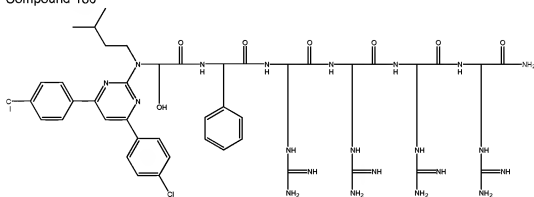
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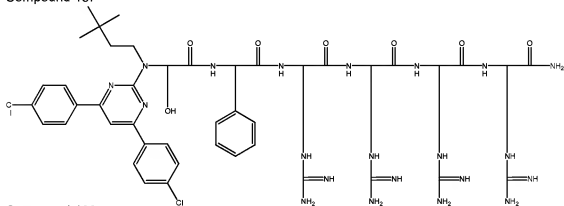
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Compound 186

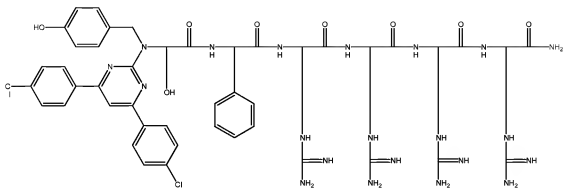


Compound 187

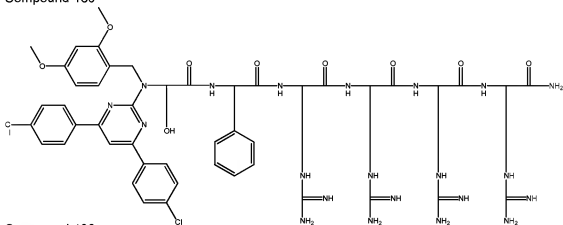


Compound 188

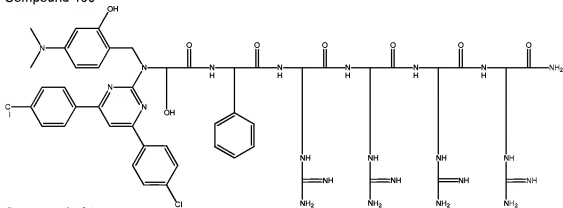
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Compound 189

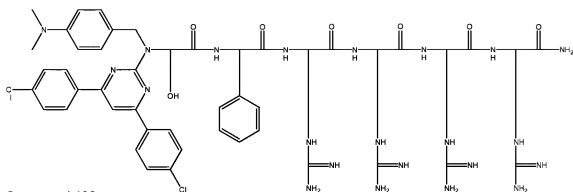


Compound 190

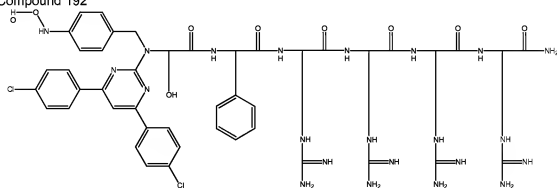


Compound 191

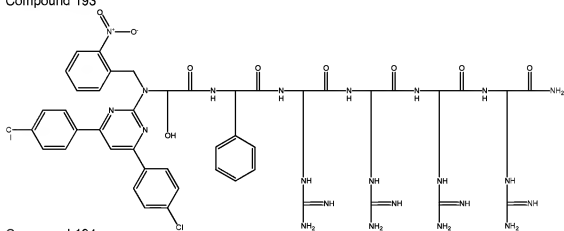
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Compound 192

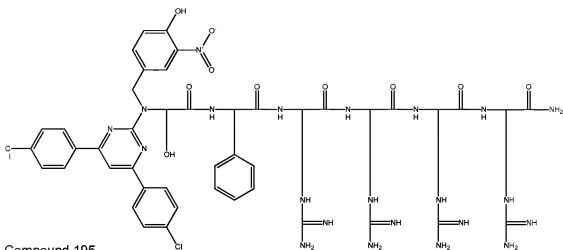


Compound 193

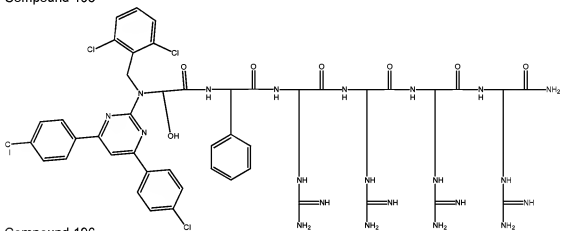


Compound 194

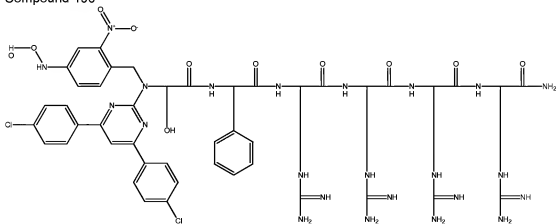
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Compound 195

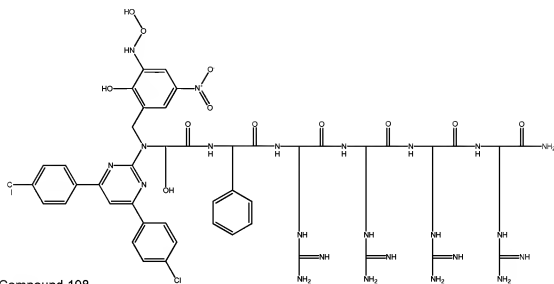


Compound 196

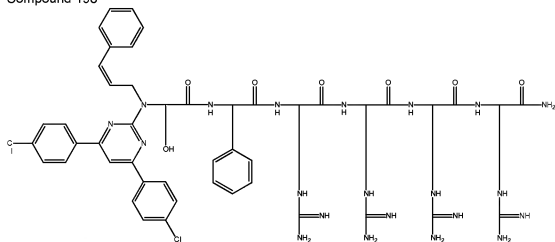


Compound 197

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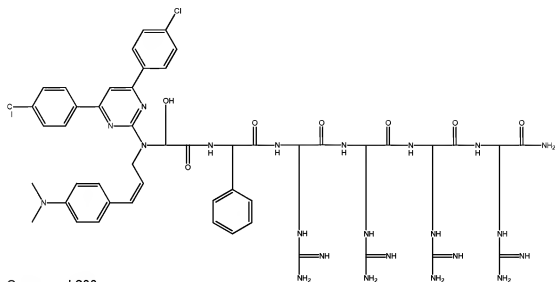


Compound 198

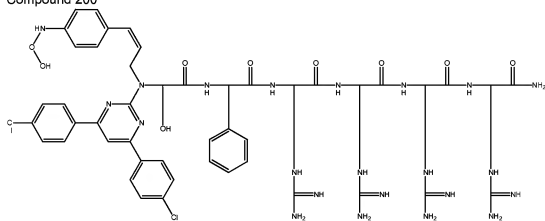


Compound 199

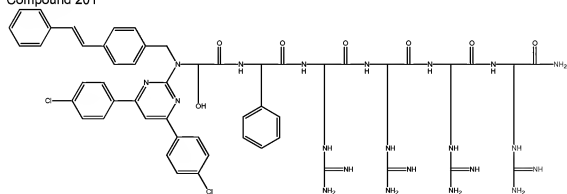
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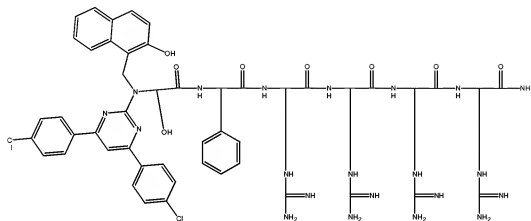
Compound 200



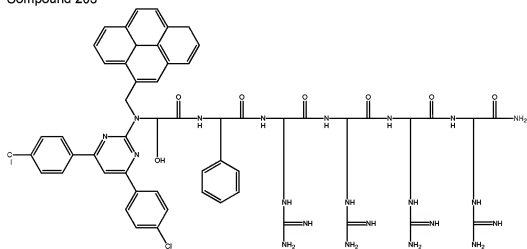
Compound 201



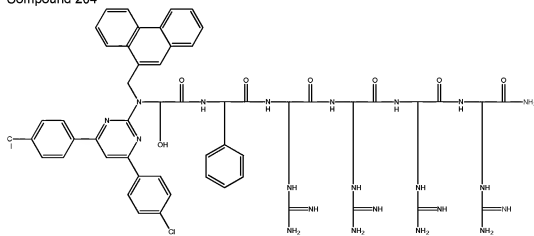
Compound 202



Compound 203

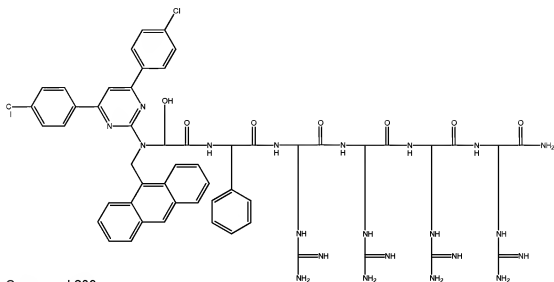


Compound 204

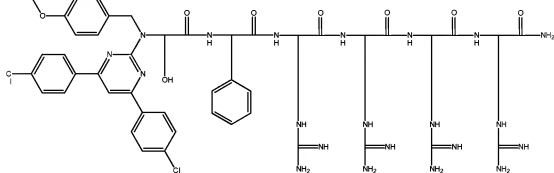


Compound 205

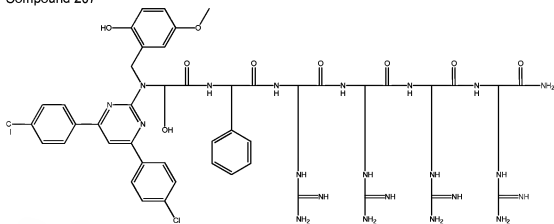
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Compound 206

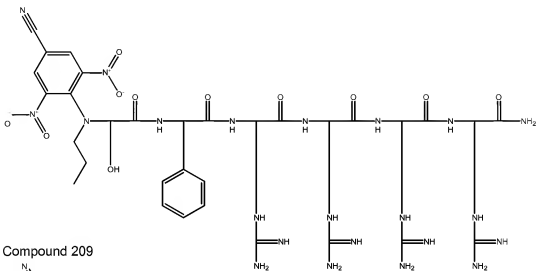


Compound 207

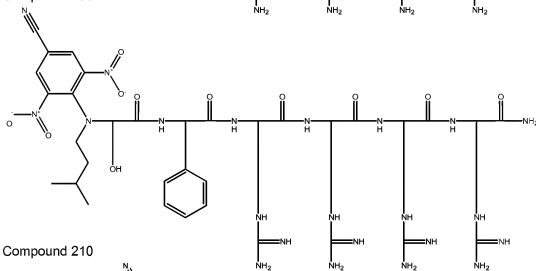


Compound 208

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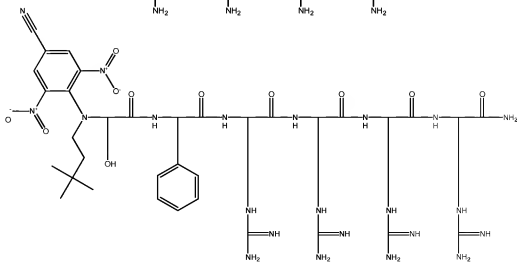


Compound 209

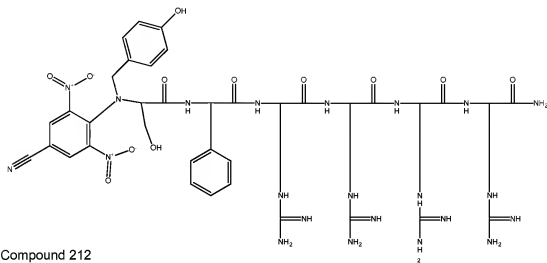


Compound 210

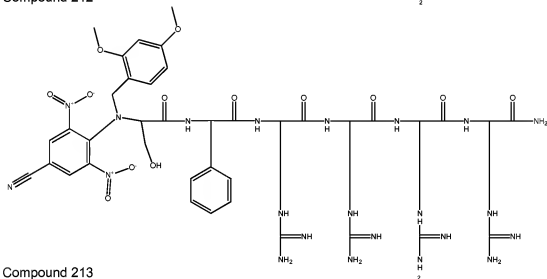
Compound 211



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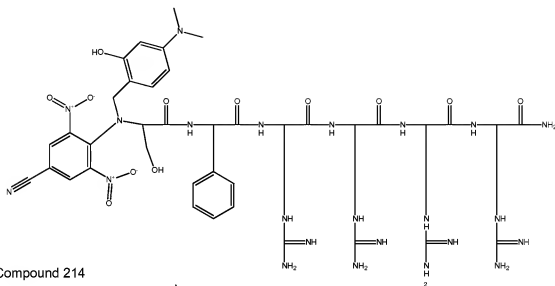


Compound 212

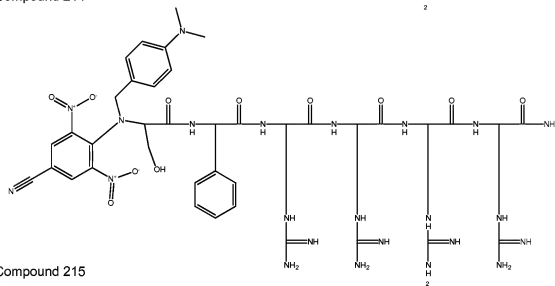


Compound 213

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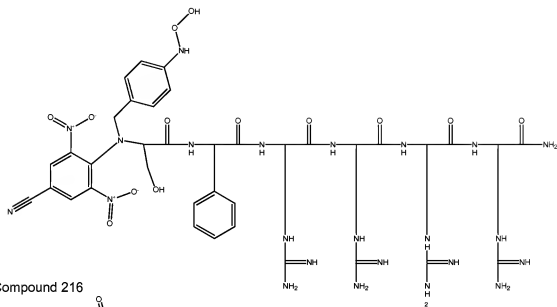


Compound 214

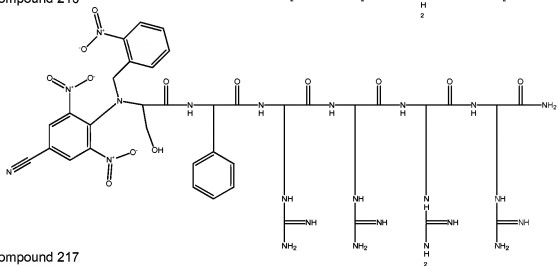


Compound 215

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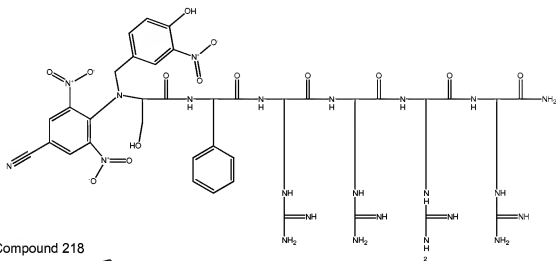


Compound 216

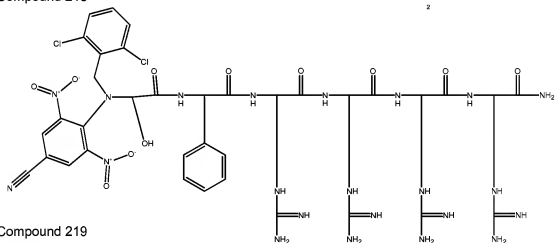


Compound 217

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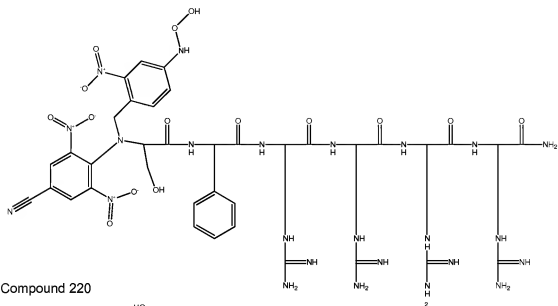


Compound 218

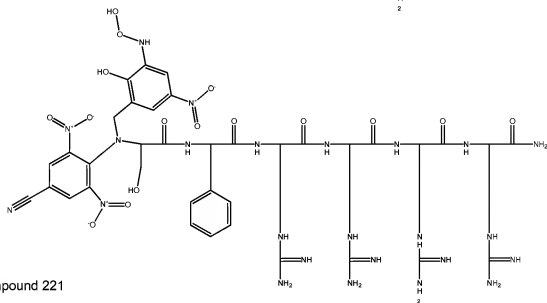


Compound 219

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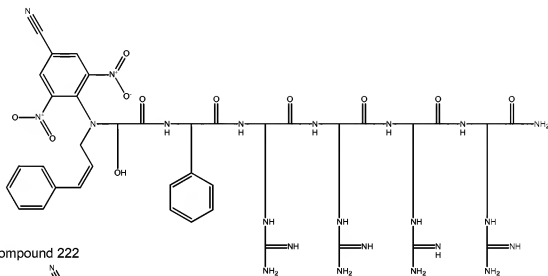


Compound 220

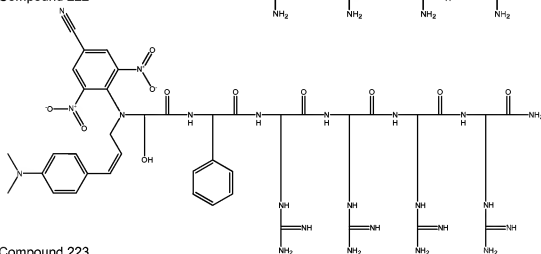


Compound 221

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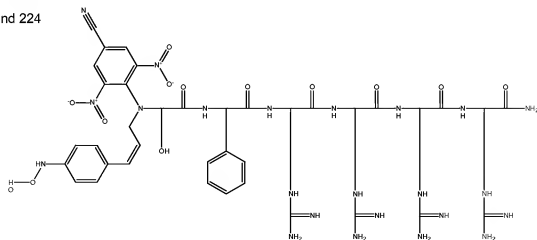


Compound 222

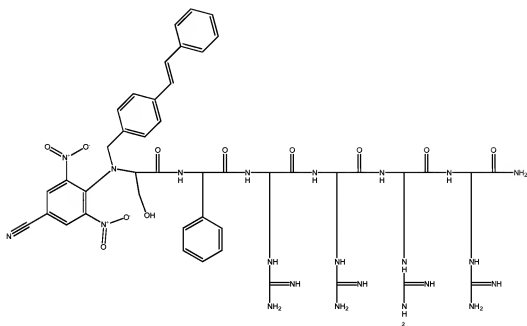


Compound 223

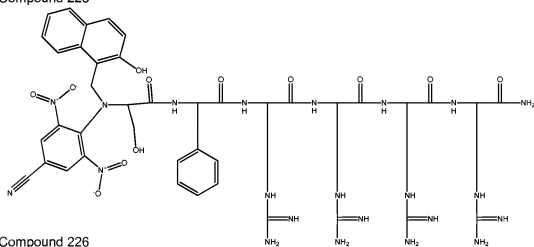
Compound 224



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Compound 225

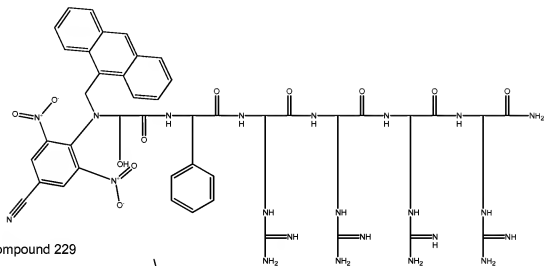


Compound 226

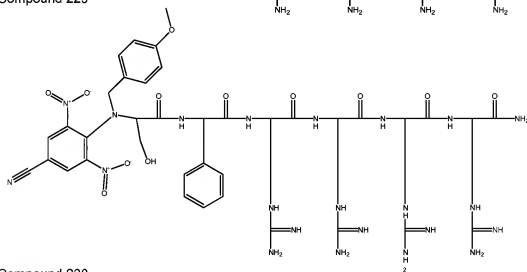
439227.1



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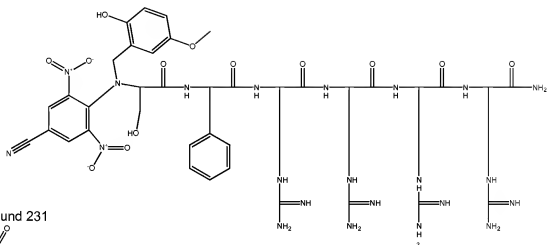


Compound 229

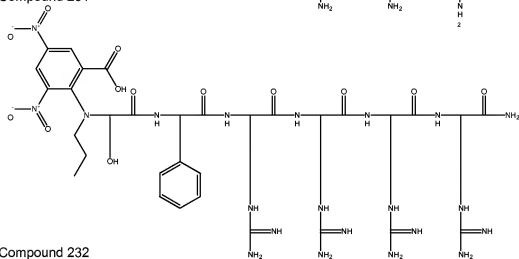


Compound 230

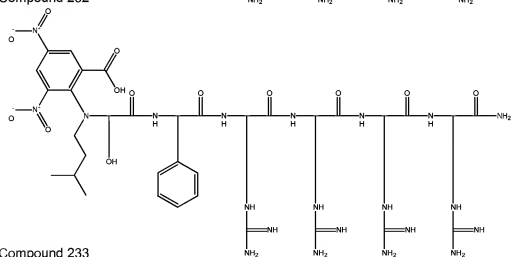
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Compound 231

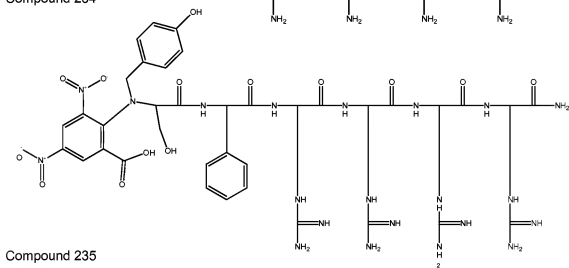
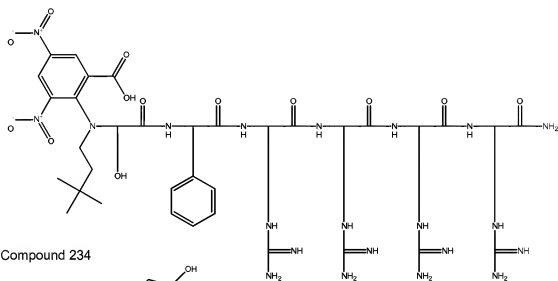


Compound 232

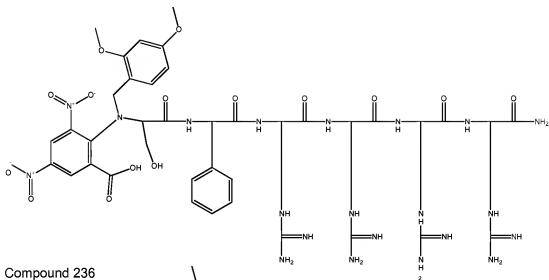


Compound 233

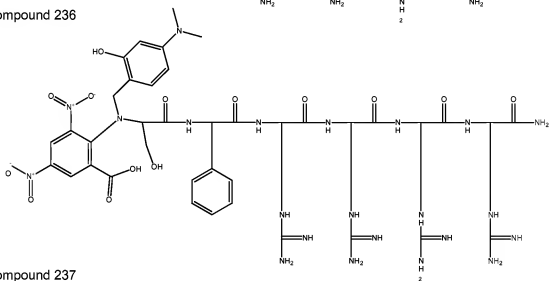
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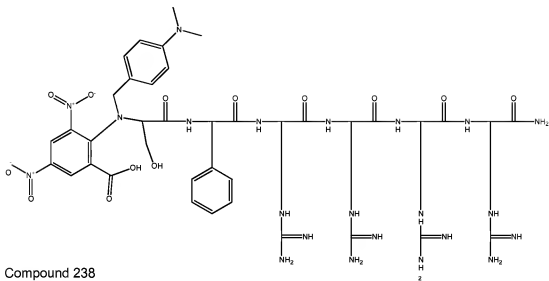


Compound 236

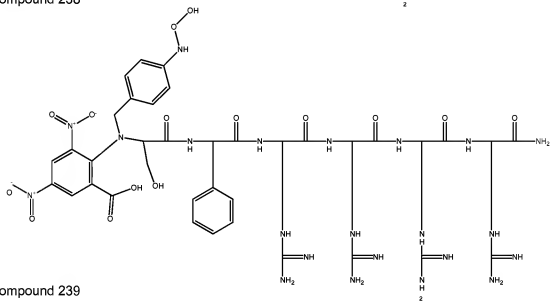


Compound 237

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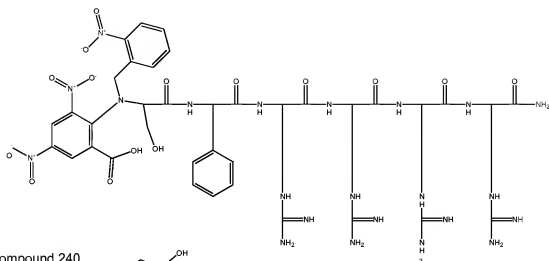


Compound 238

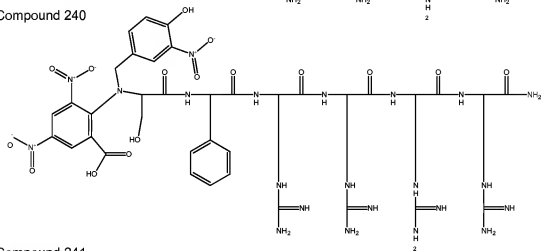


Compound 239

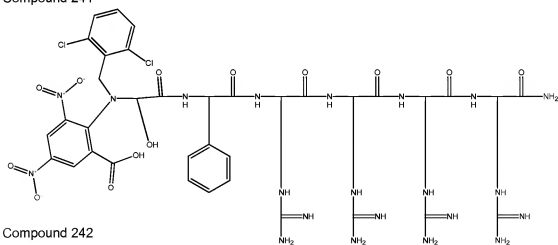
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Compound 240



Compound 241



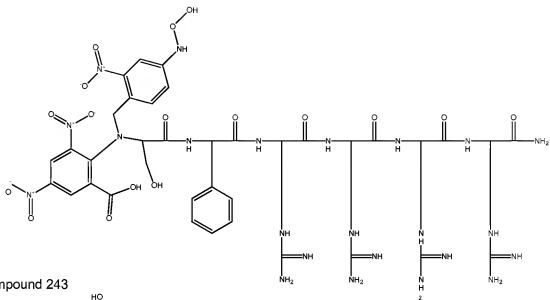
Compound 242

Applicant: David S. Lawrence

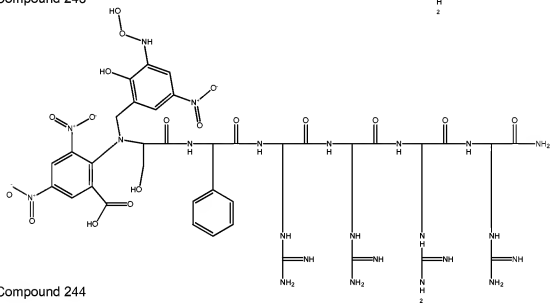
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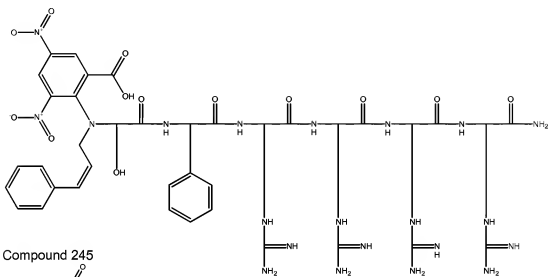


Compound 243

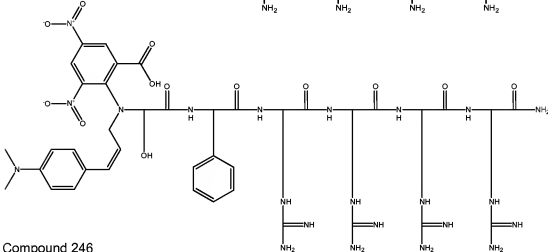


Compound 244

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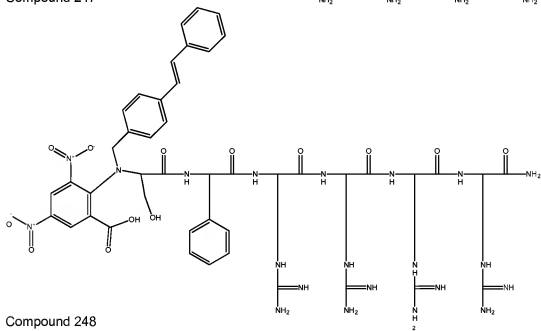
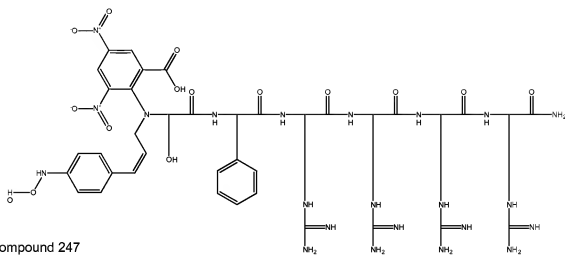


Compound 245

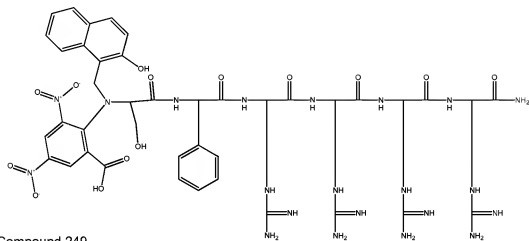


Compound 246

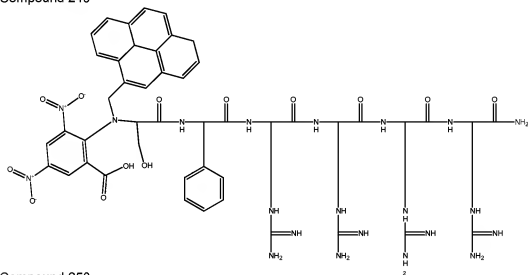
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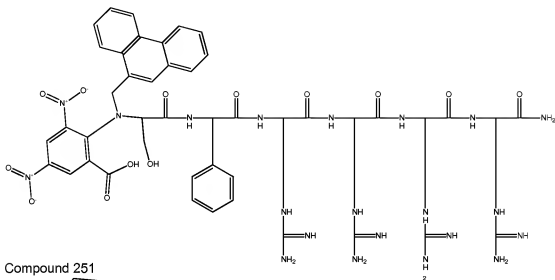


Compound 249

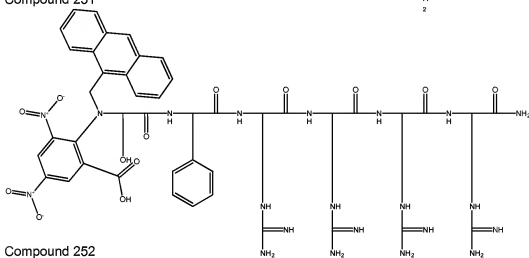


Compound 250

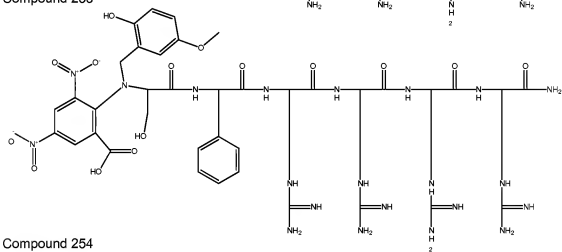
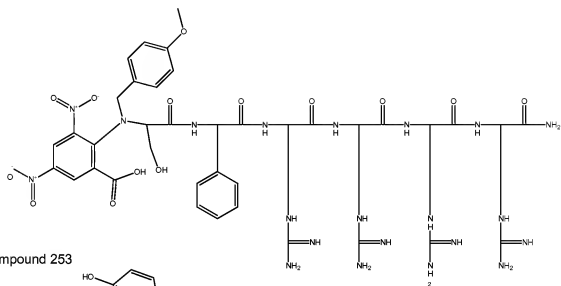
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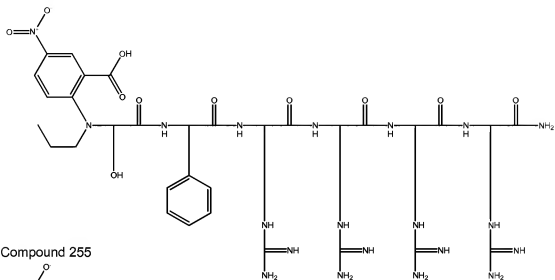
Compound 251



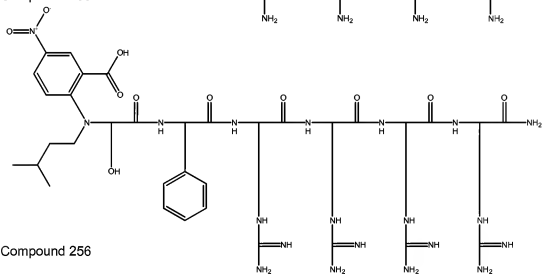
Compound 252



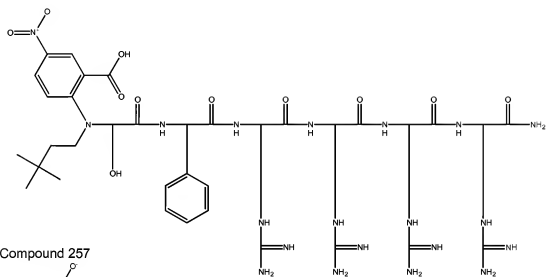
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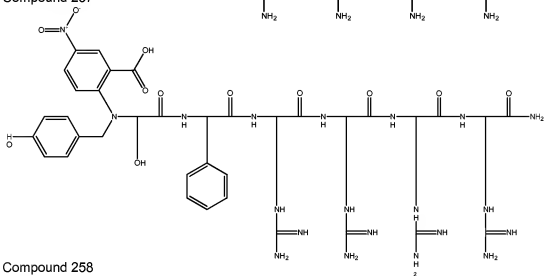
Compound 255



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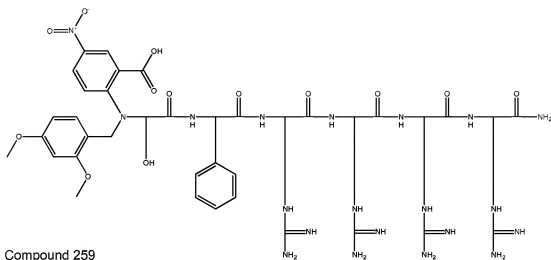


Compound 257

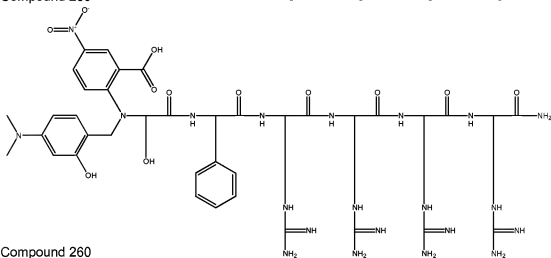


Compound 258

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Compound 259

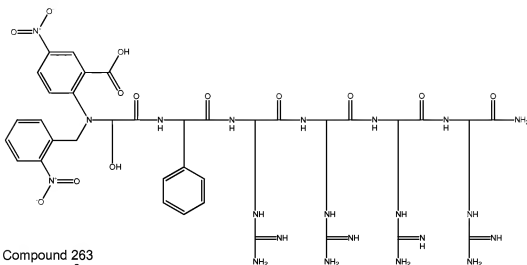


Compound 260

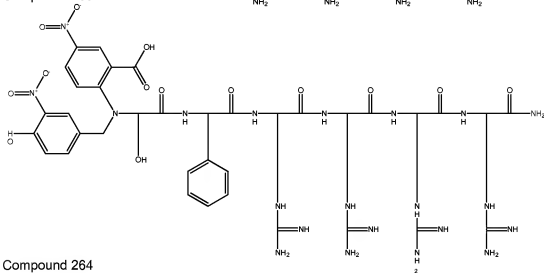
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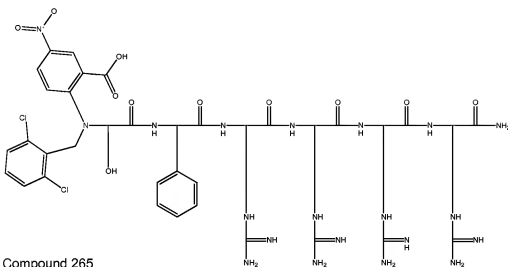


Compound 263

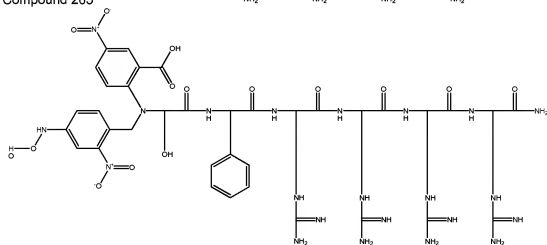


Compound 264

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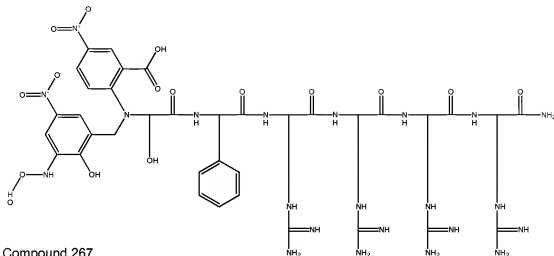


Compound 265

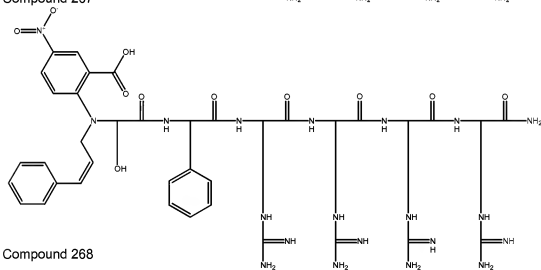


Compound 266

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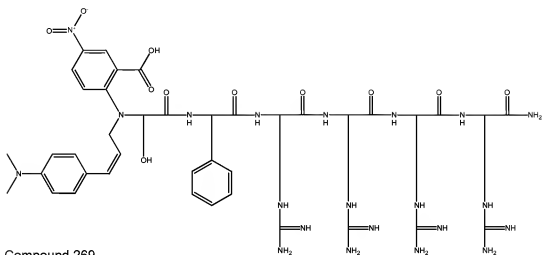


Compound 267

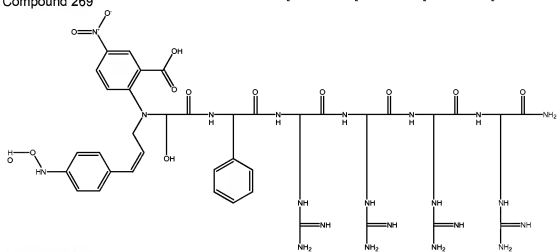


Compound 268

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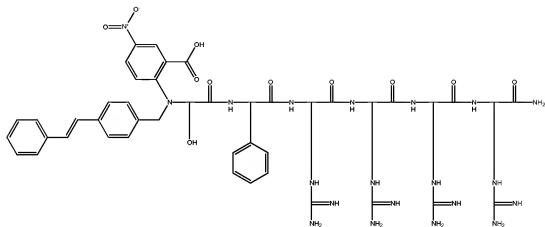


Compound 269

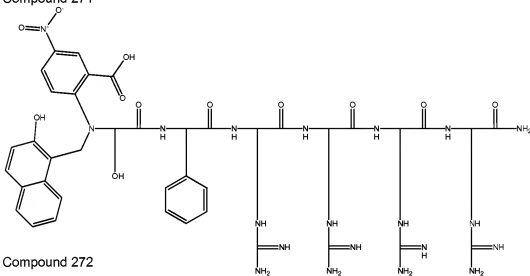


Compound 270

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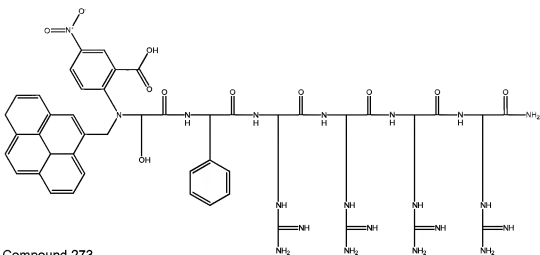


Compound 271

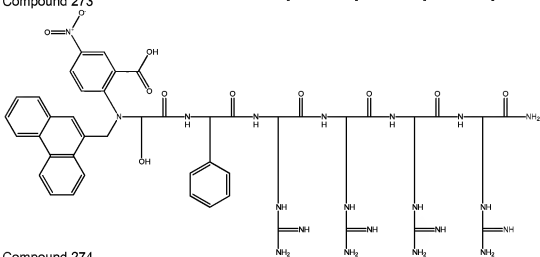


Compound 272

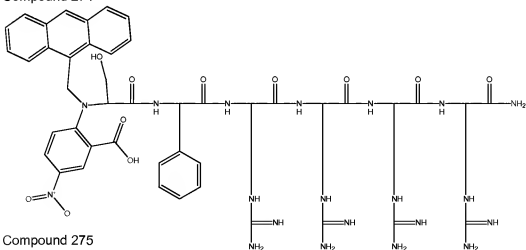
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Compound 274

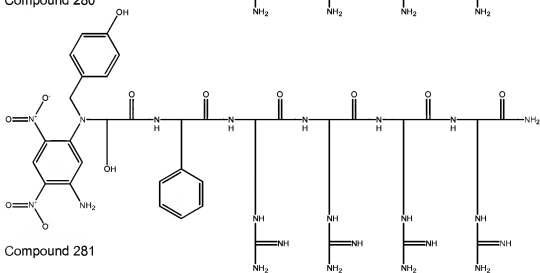
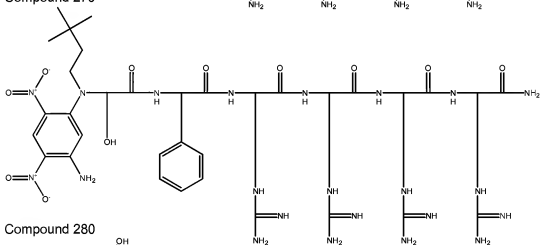
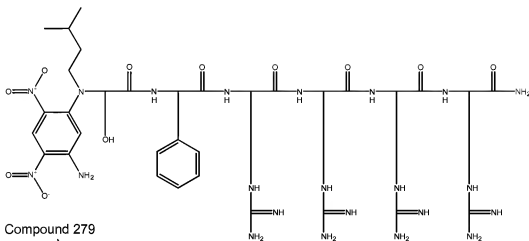


Compound 275

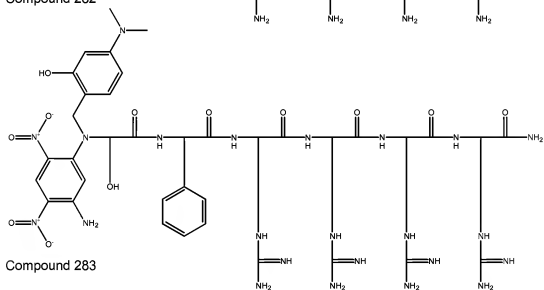
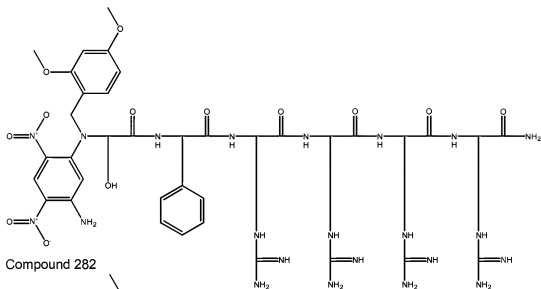
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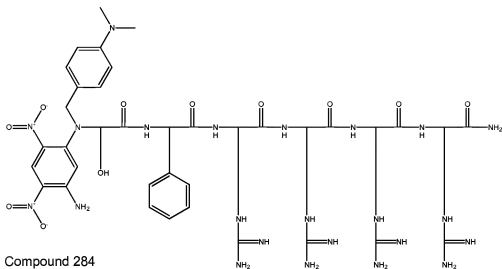
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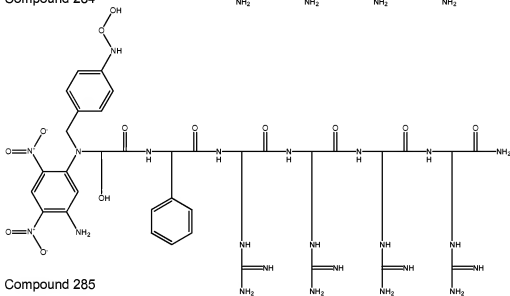
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Compound 284



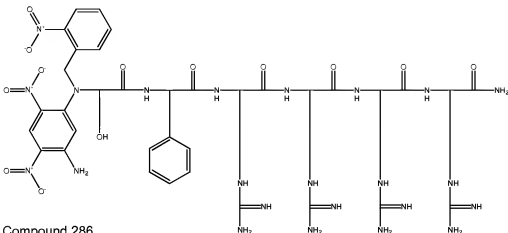
Compound 285

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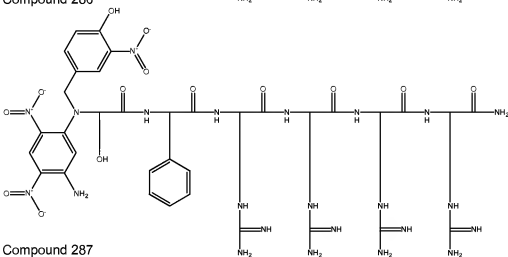
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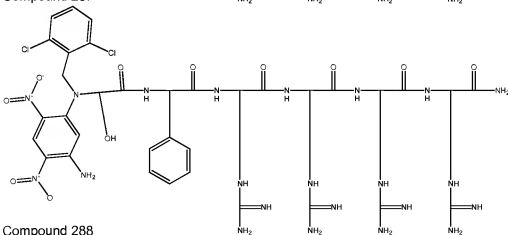
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Compound 286

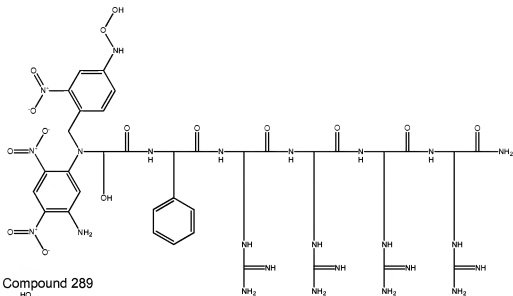


Compound 287

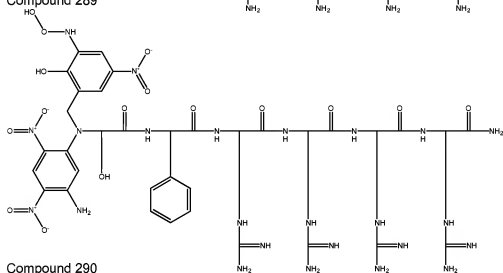


Compound 288

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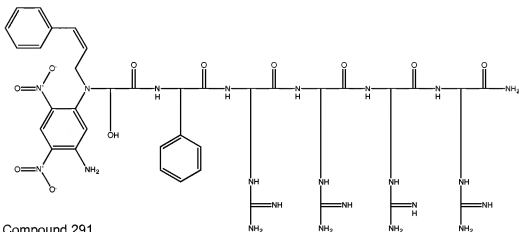


Compound 289

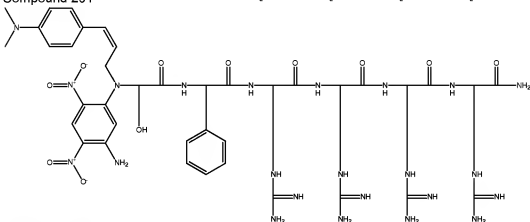


Compound 290

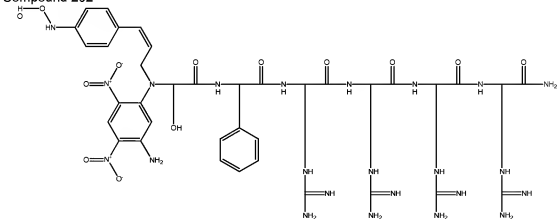
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Compound 291

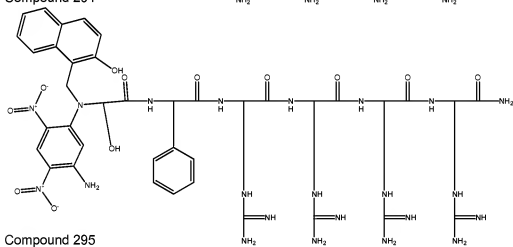
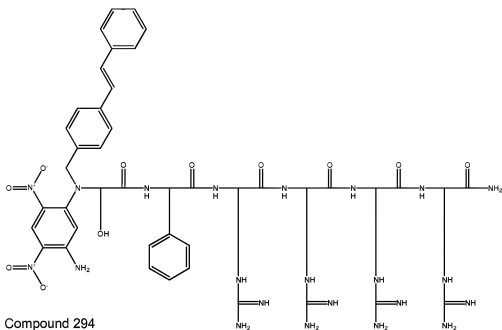


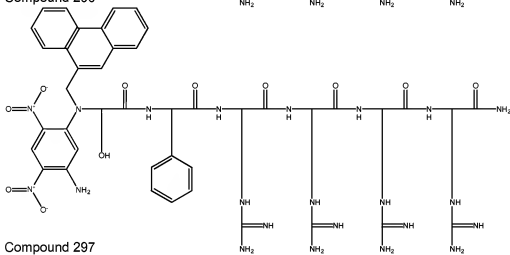
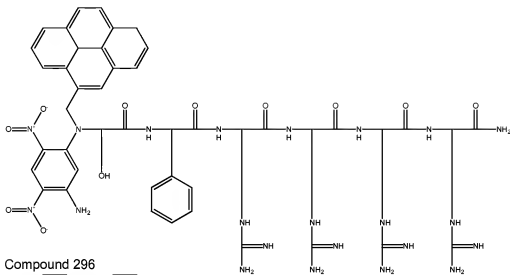
Compound 292



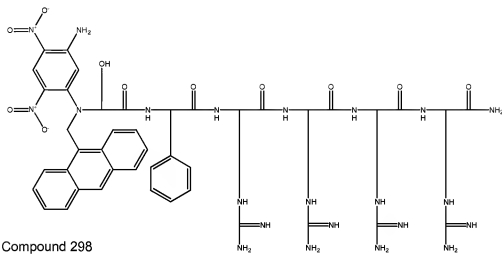
Compound 293

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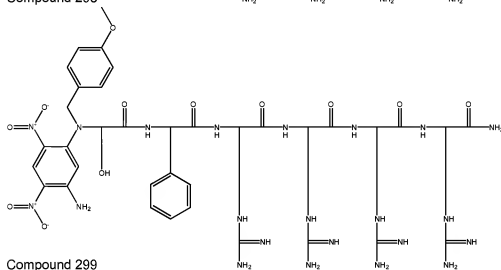




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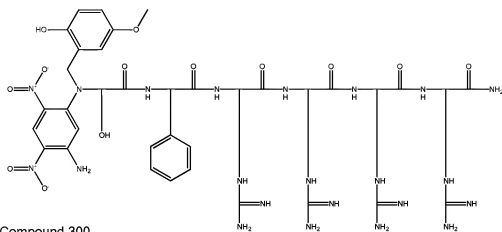


Compound 298

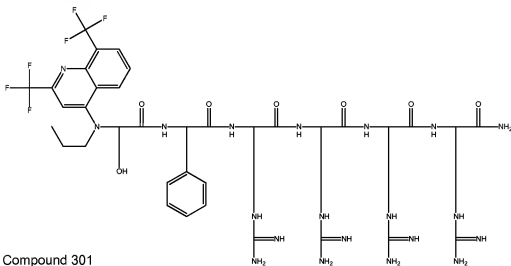


Compound 299

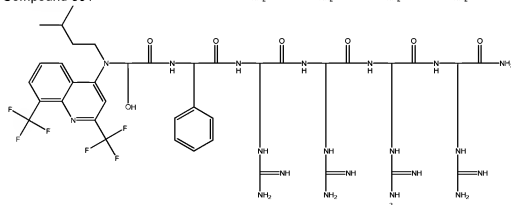
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Compound 300

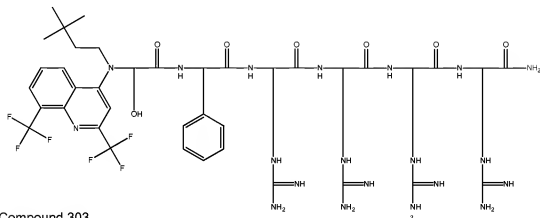


Compound 301

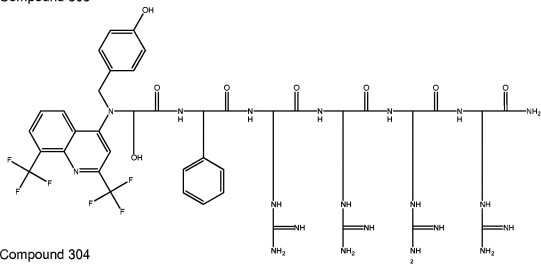


Compound 302

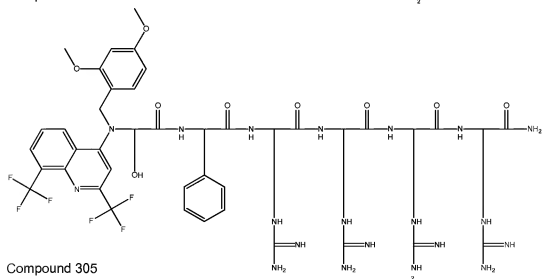
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Compound 303

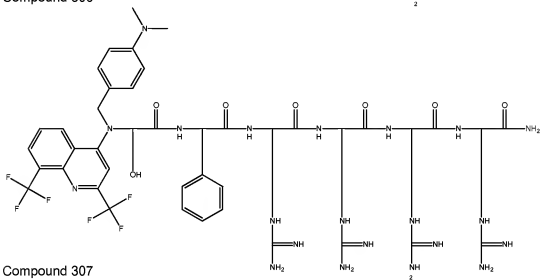
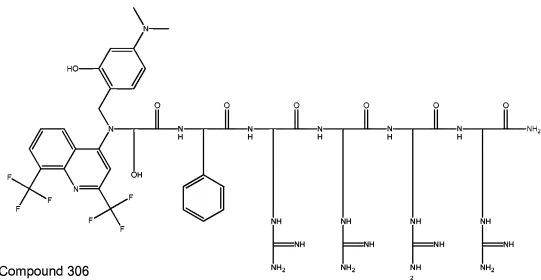


Compound 304

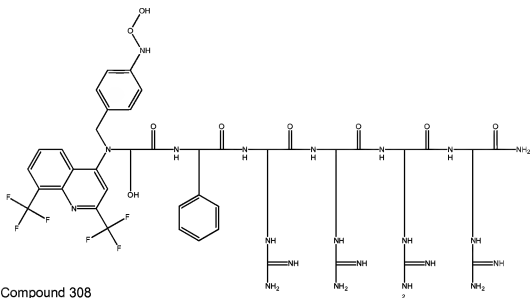


Compound 305

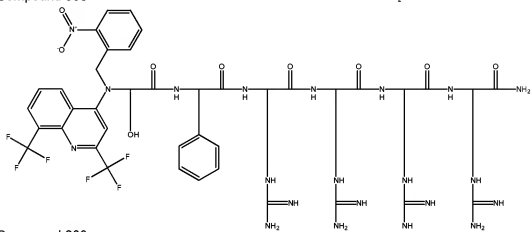
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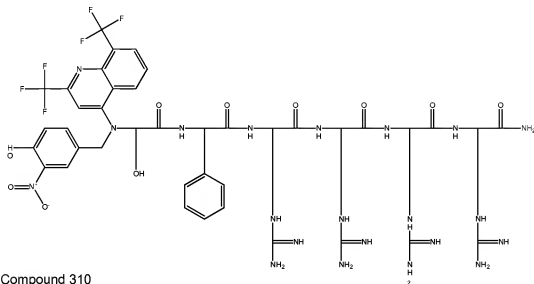


Compound 308

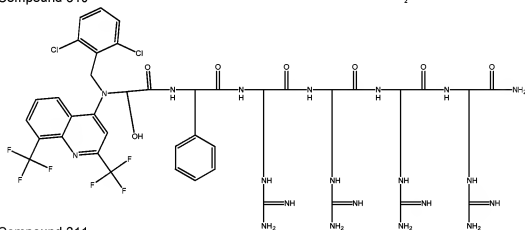


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Compound 310

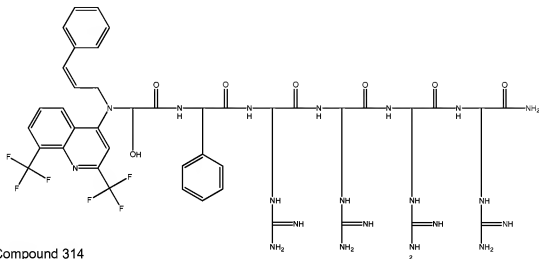


Compound 311

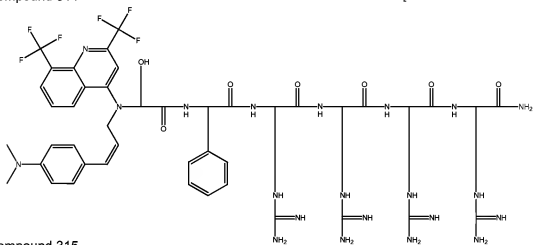
439227.1



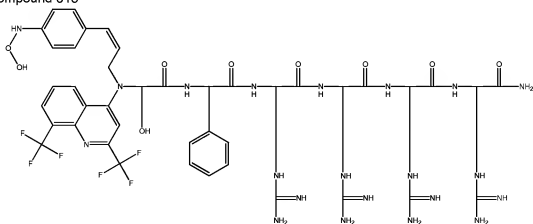
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Compound 314

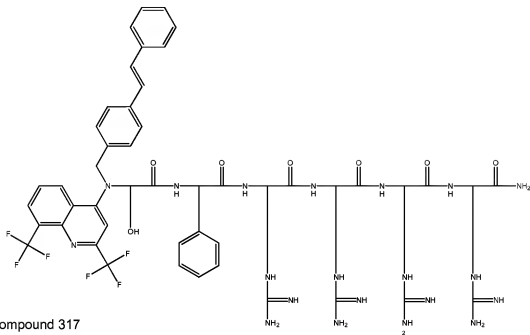


Compound 315

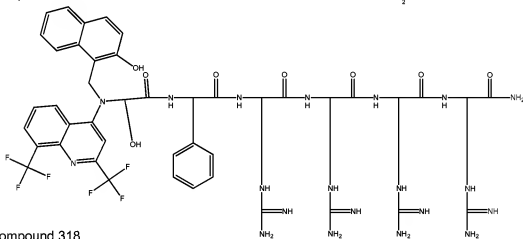


Compound 316

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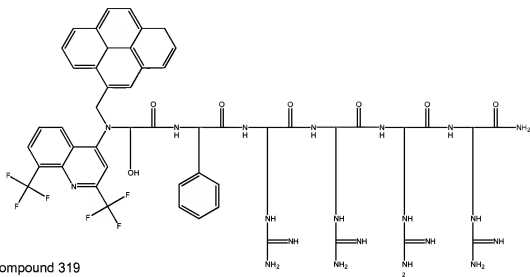


Compound 317

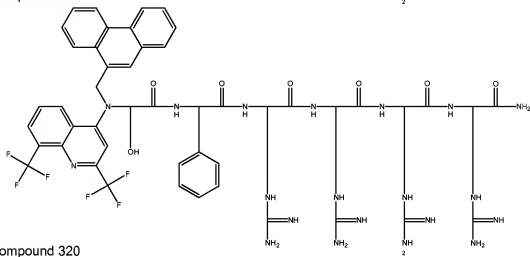


Compound 318

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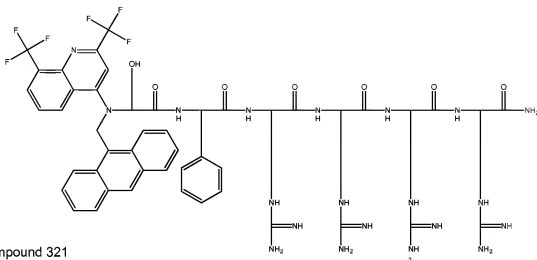


Compound 319

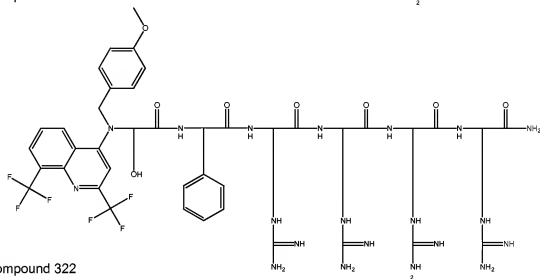


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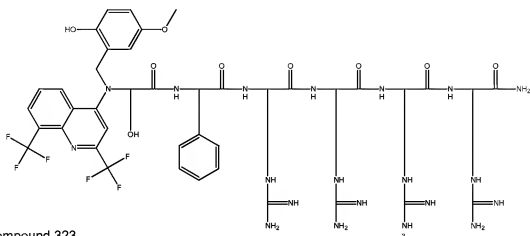


Compound 321

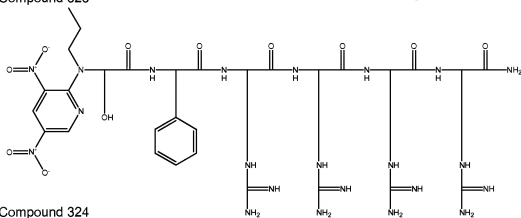


Compound 322

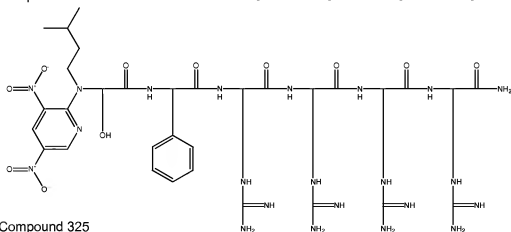
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Compound 323

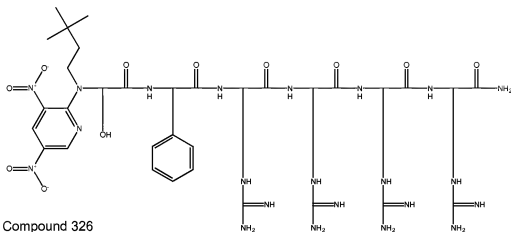


Compound 324

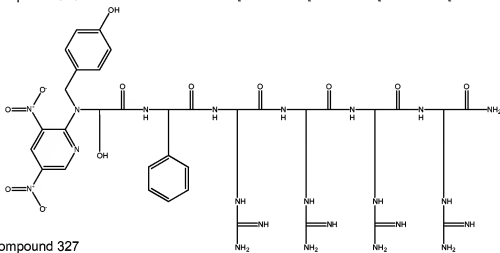


Compound 325

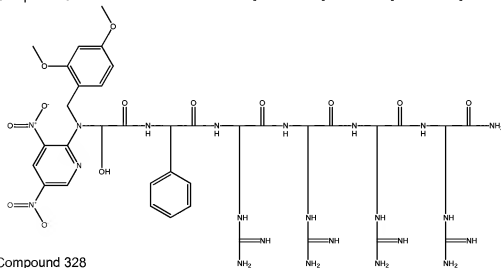
439227.1



Compound 326

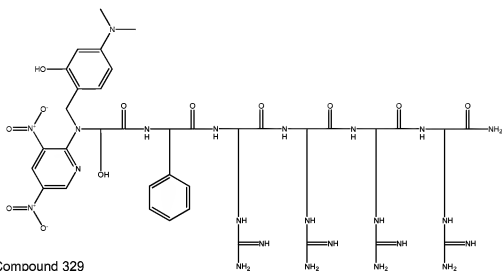


Compound 327

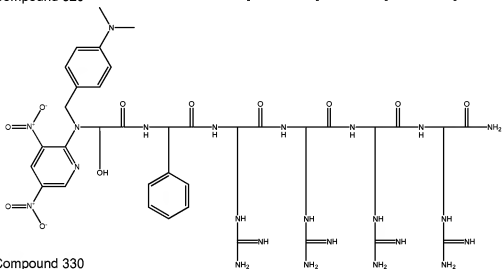


Compound 328

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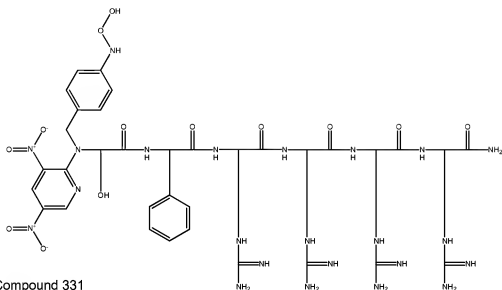


Compound 329

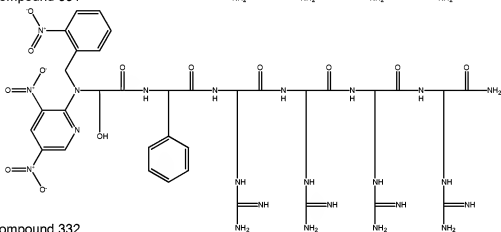


Compound 330

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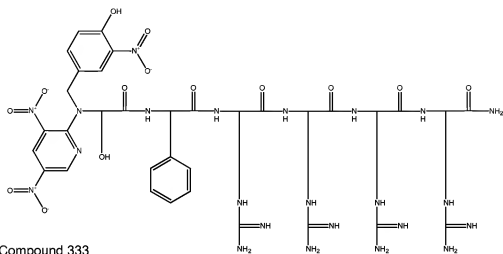


Compound 331

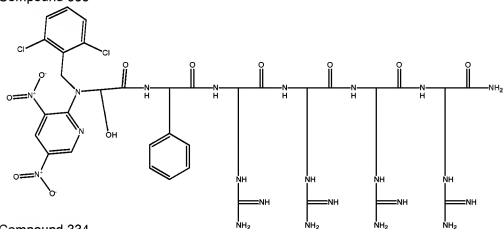


Compound 332

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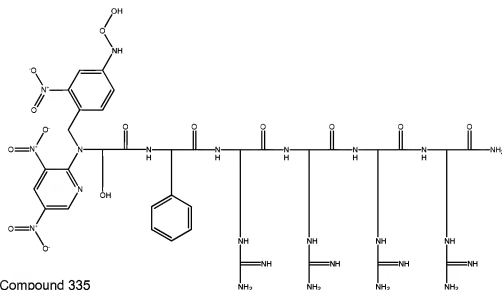


Compound 333

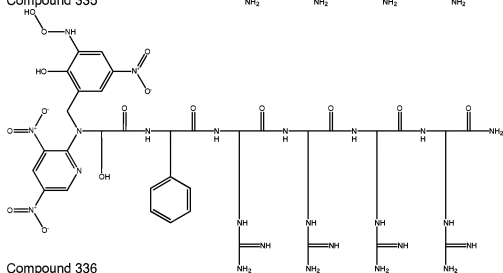


Compound 334

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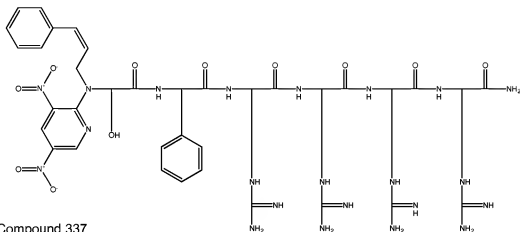


Compound 335

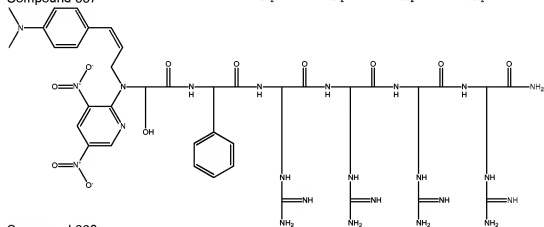


Compound 336

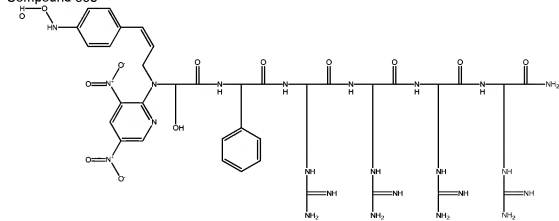
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Compound 337

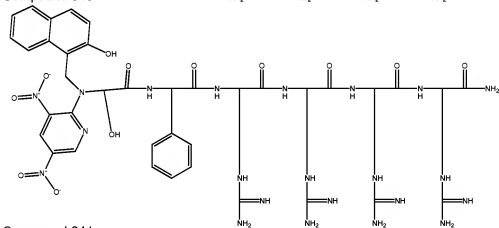
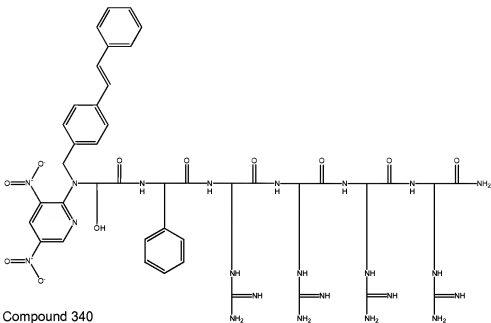


Compound 338

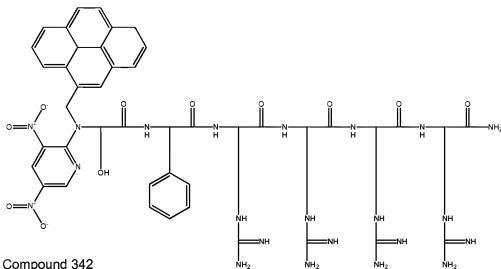


Compound 339

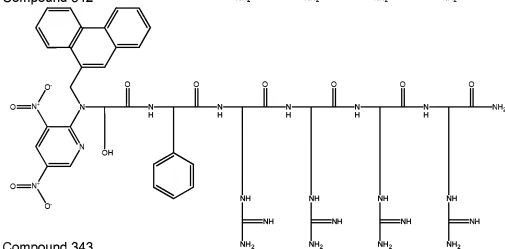
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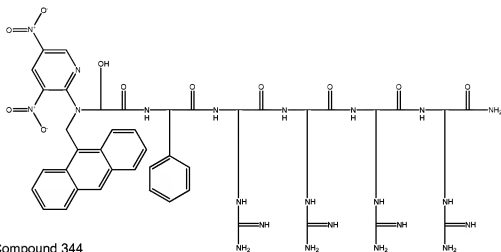


Compound 342

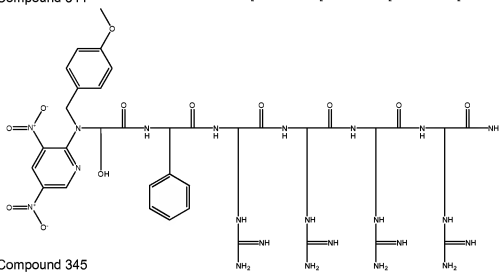


Compound 343

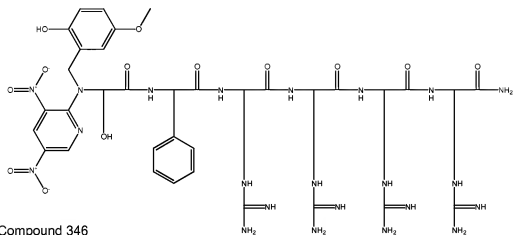
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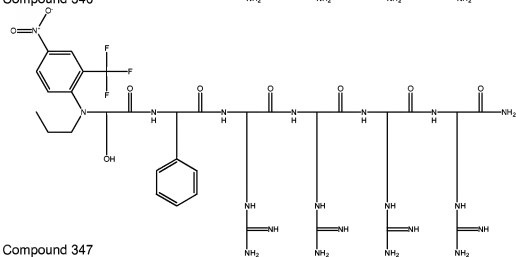
Compound 344



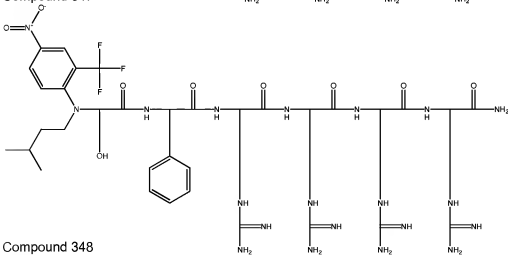
Compound 345



Compound 346

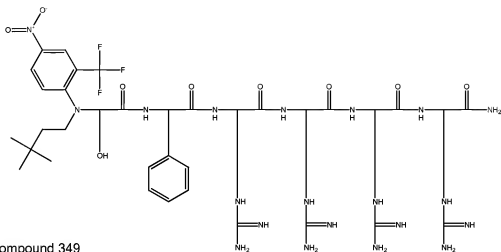


Compound 347

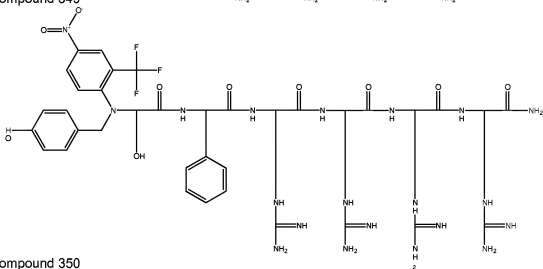


Compound 348

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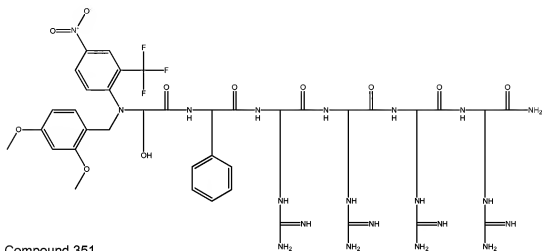


Compound 349

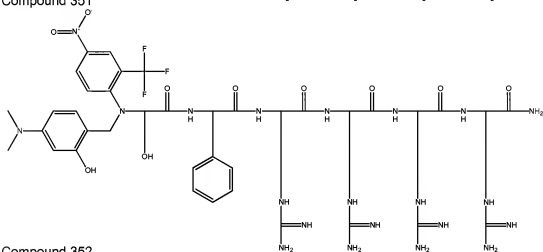


Compound 350

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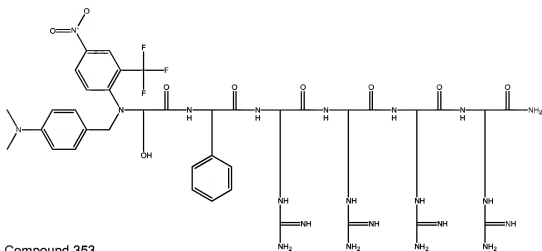


Compound 351

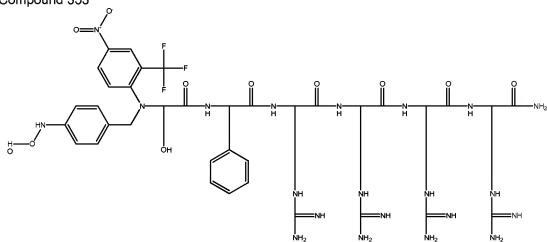


Compound 352

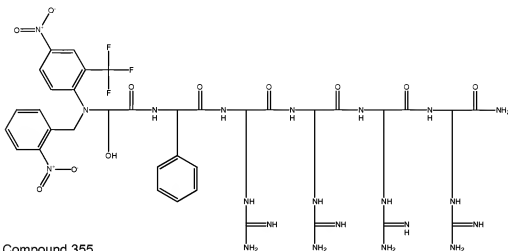
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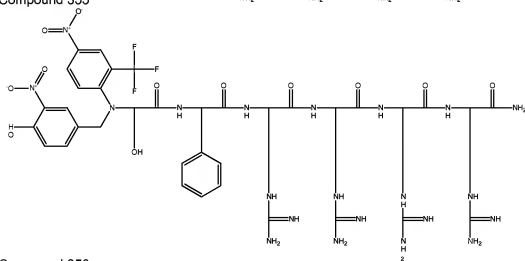
Compound 353



Compound 354

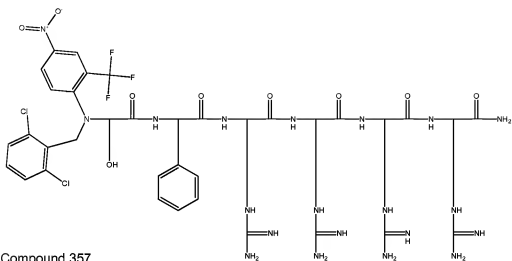


Compound 355

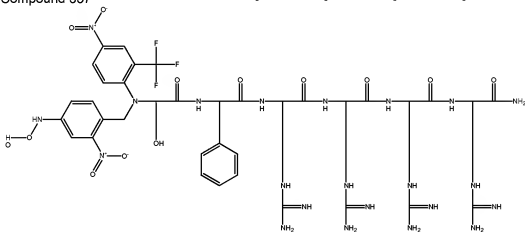


Compound 356

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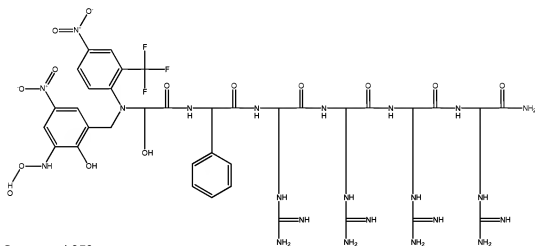


Compound 357

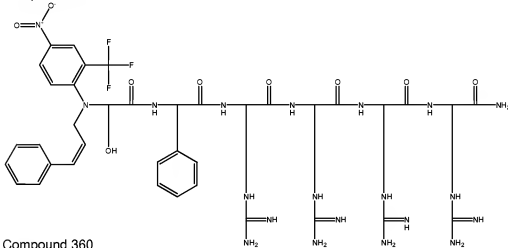


Compound 358

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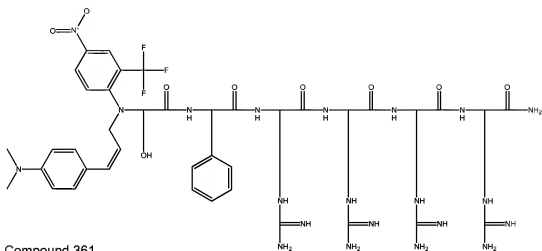


Compound 359

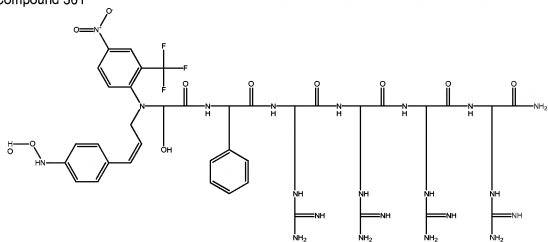


Compound 360

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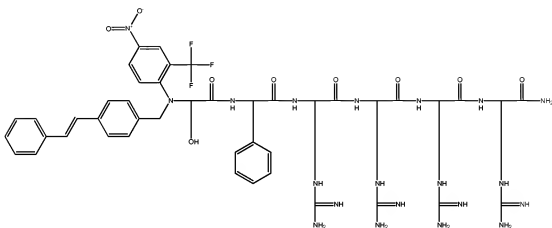


Compound 361

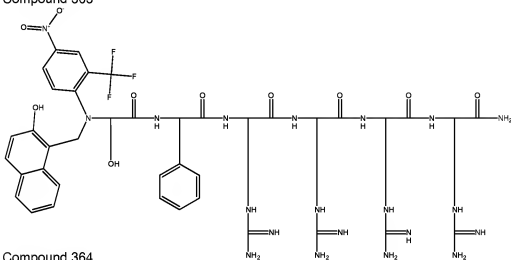


Compound 362

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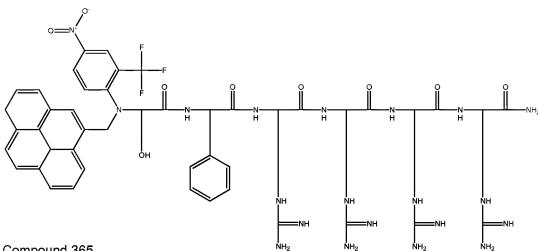


Compound 363

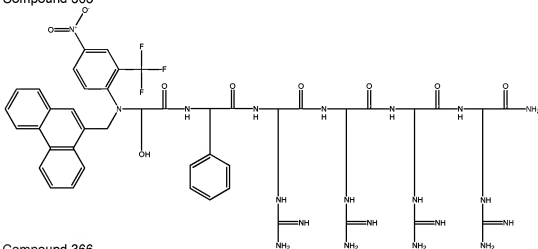


Compound 364

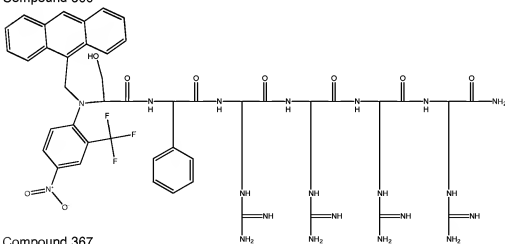
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Compound 365

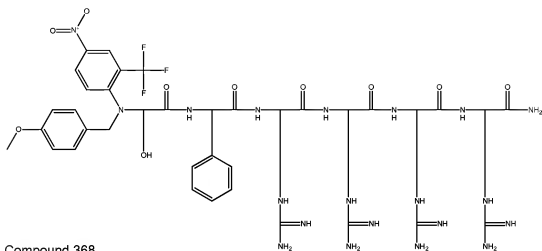


Compound 366

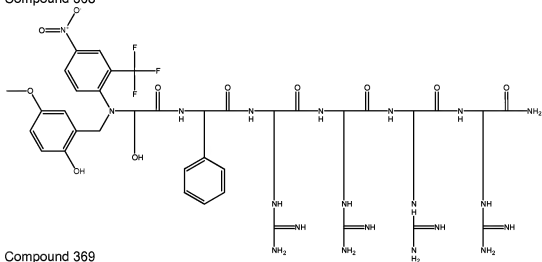


Compound 367

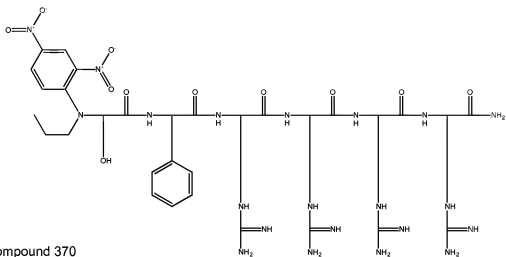
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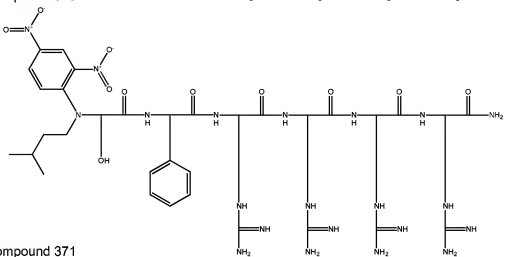
Compound 368



Compound 369

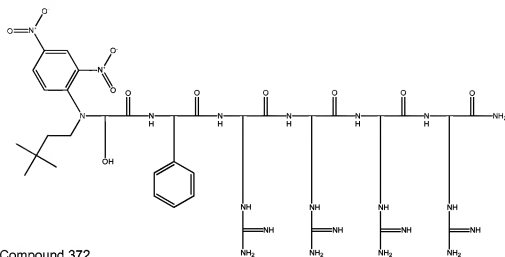


Compound 370

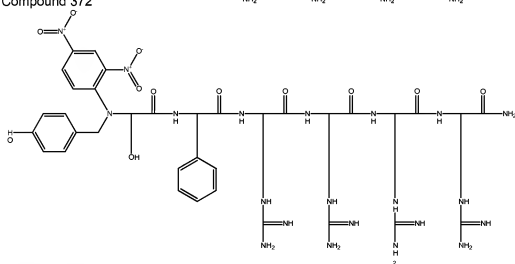


Compound 371

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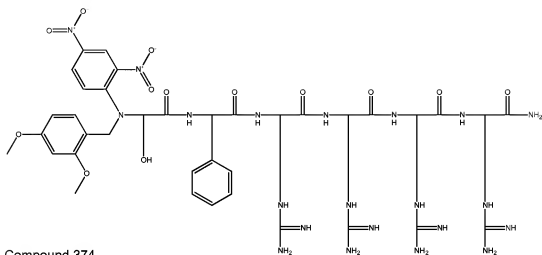


Compound 372

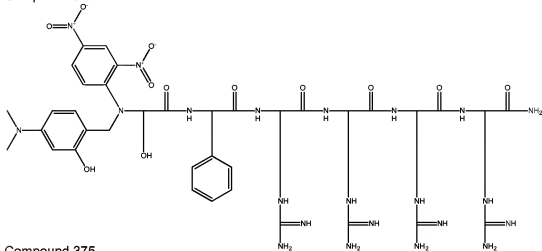


Compound 373

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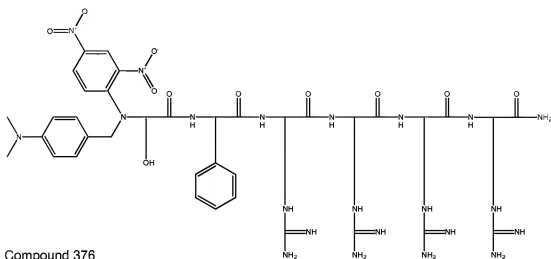


Compound 374

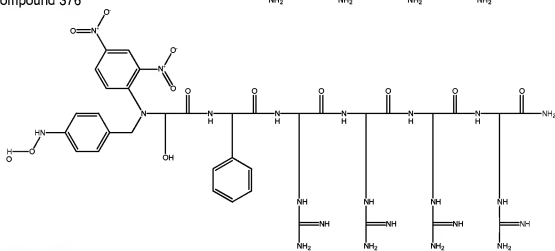


Compound 375

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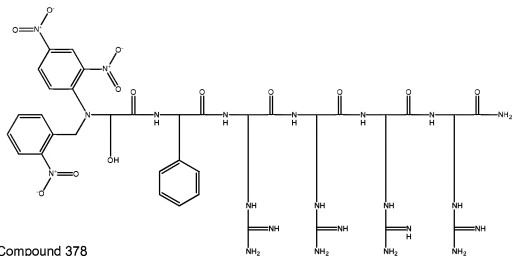


Compound 376

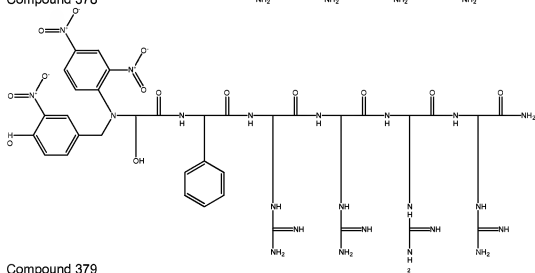


Compound 377

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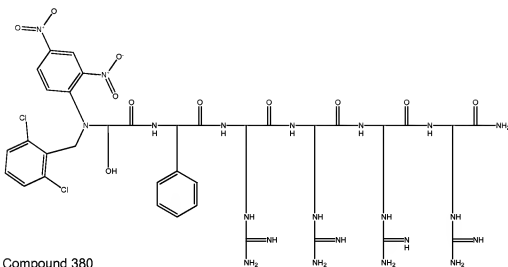


Compound 378

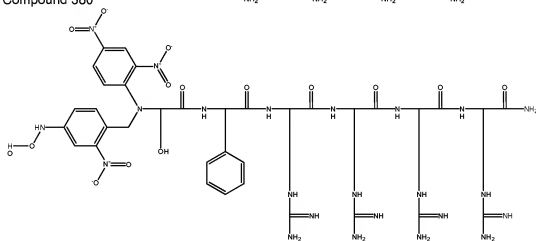


Compound 379

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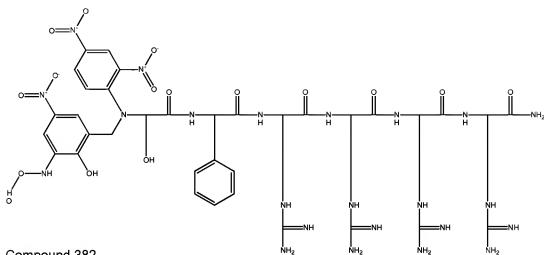


Compound 380

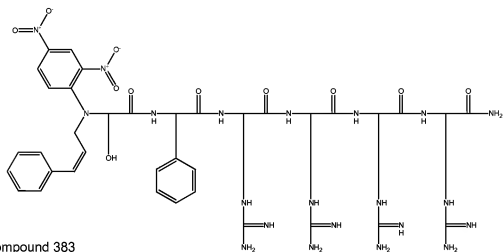


Compound 381

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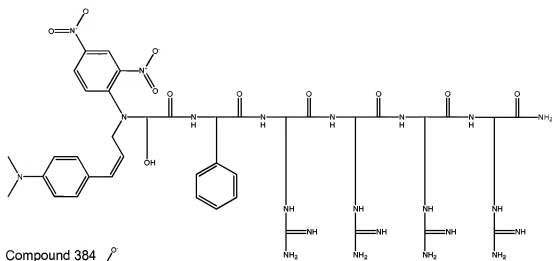


Compound 382

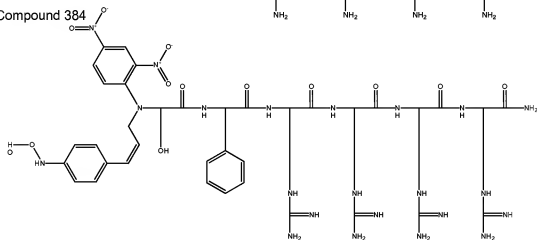


Compound 383

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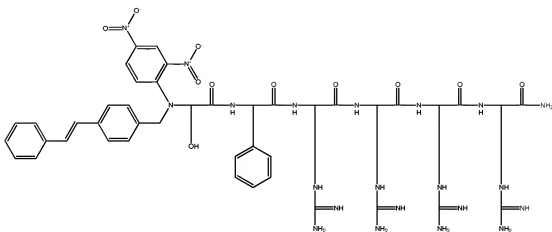


Compound 384

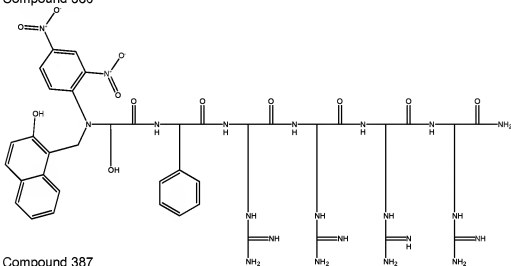


Compound 385

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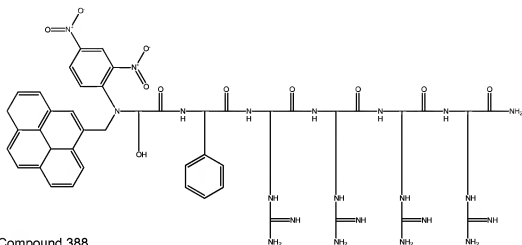


Compound 386

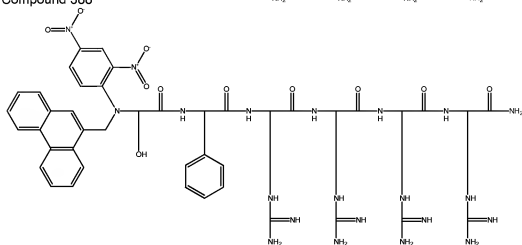


Compound 387

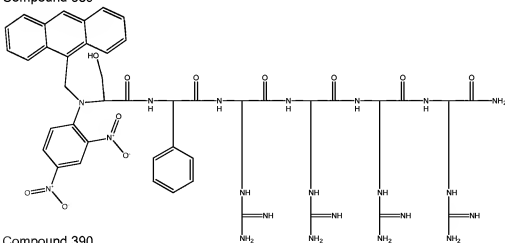
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Compound 388

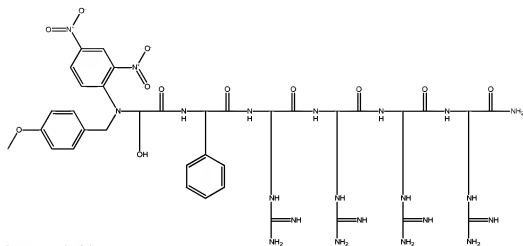


Compound 389

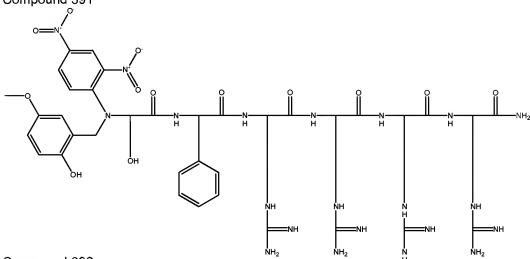


Compound 390

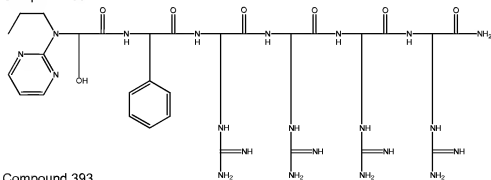
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Compound 391

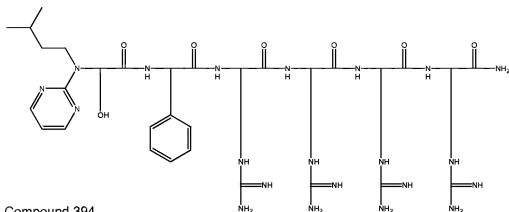


Compound 392

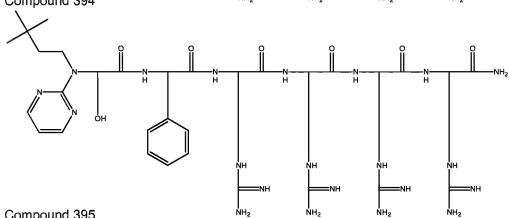


Compound 393

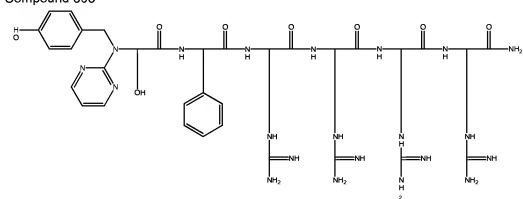
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Compound 394

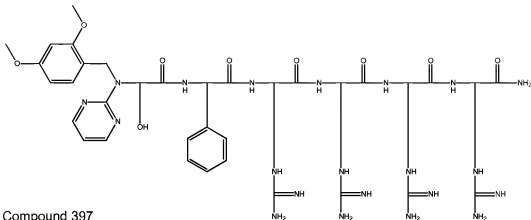


Compound 395

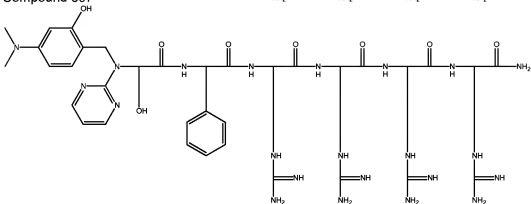


Compound 396

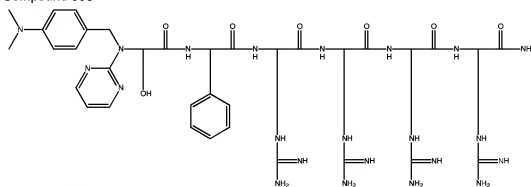
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Compound 397

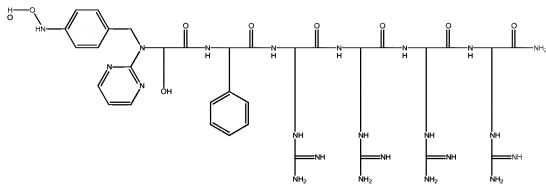


Compound 398

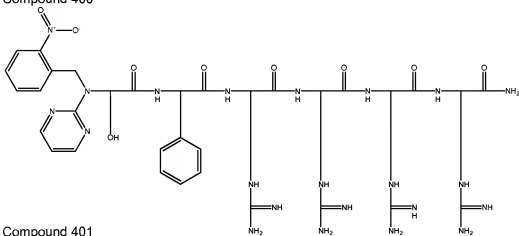


Compound 399

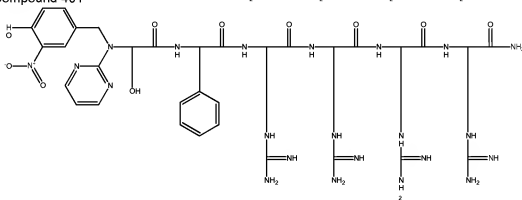
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Compound 400

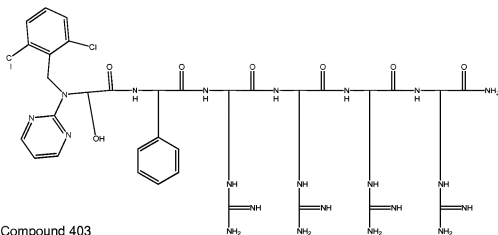


Compound 401

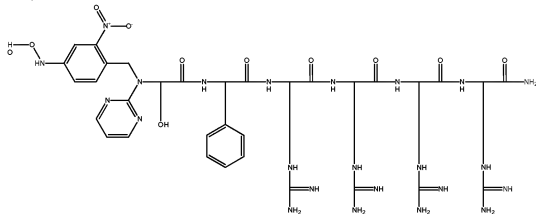


Compound 402

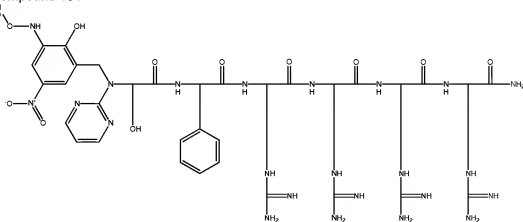
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Compound 403



Compound 404



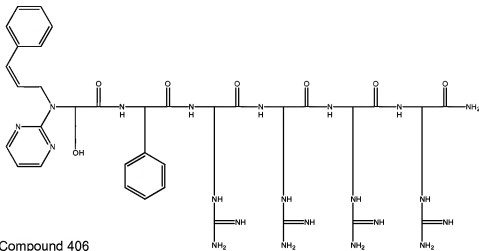
Compound 405

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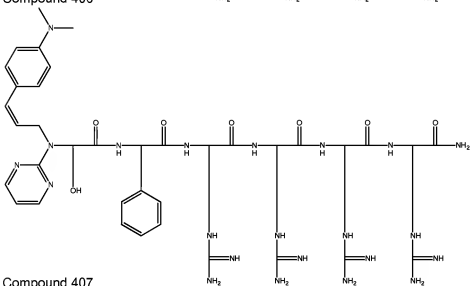
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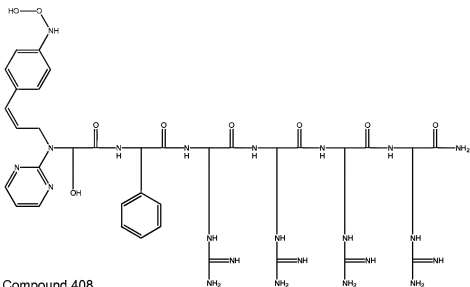


Compound 406

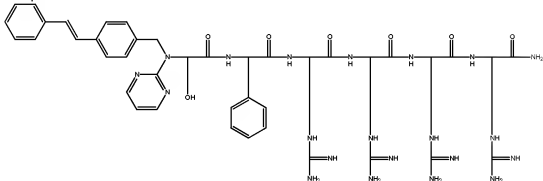


Compound 407

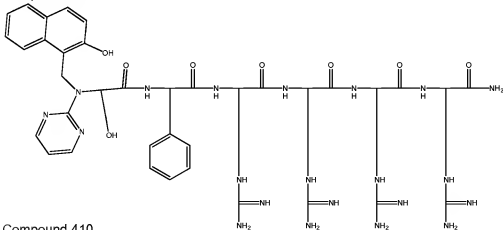
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Compound 408

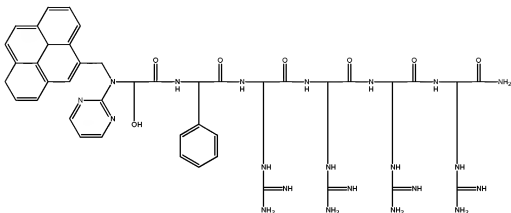


Compound 409

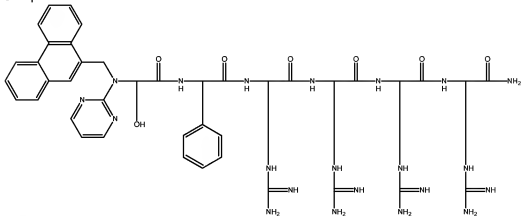


Compound 410

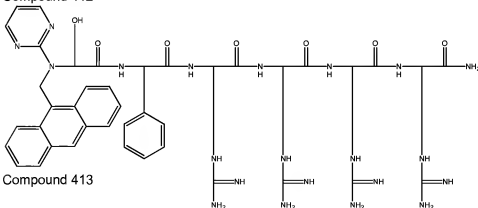
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Compound 411

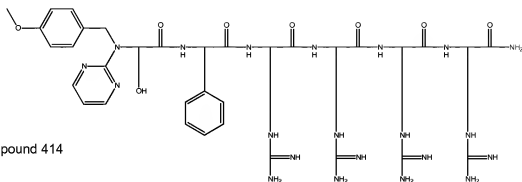


Compound 412



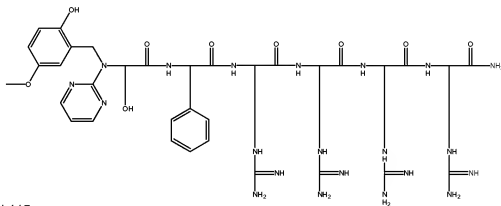
Compound 413

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Compound 414

and

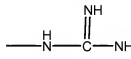


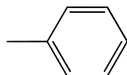
Compound 415

wherein amino acid chains are indicated as follows:

-OH represents serine,

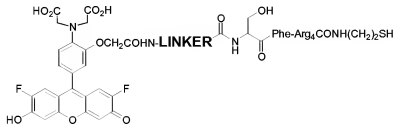
-NH₂ represents lysine,

 represents arginine, and

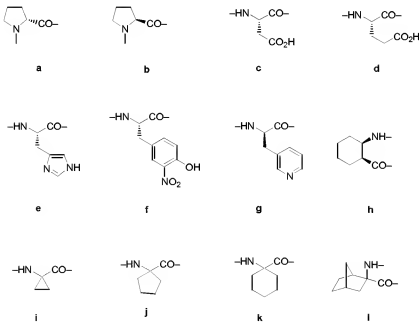
 represents phenylalanine.

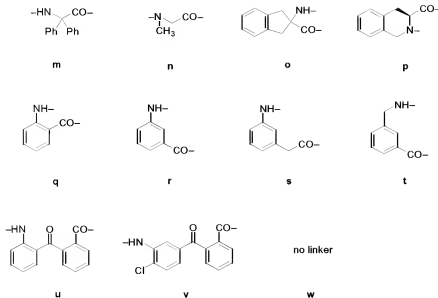
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89. (Currently amended) A chemical compound comprising SEQ ID NO:1 having the structure:



wherein the LINKER is selected from the group consisting of the following:





90. (Previously presented) A chemical compound having the structure:

fluorophore-LINKER-X-FRRRRK-amide (SEQ ID NO:3);

wherein F is phenylalanine; K is lysine; R is arginine; and X is serine, threonine, or tyrosine, and wherein the linker is selected from the group consisting of a carboxamide linker, an aminobenzoic acid linker, a sulfonamide linker, a urea linker, a thiourea linker, an ester linker, a thioester linker, an alkylamine linker, an arylamine linker, an ether linker, and a thioether linker.

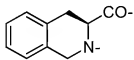
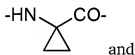
91. (Original) The chemical compound of claim 90, wherein the fluorophore is a 7-nitrobenz-2-oxa-1,3-diazole derivative.

92. (Previously presented) The chemical compound of claim 90, wherein the fluorophore comprises a fluorescein group.

93. (Currently amended) The chemical compound of claim 90, wherein the fluorophore comprises a dansyl group, an acridine group, an Alexa Fluor® group, a BODIPY® group, an Oregon Green® group, a Rhodamine Green group, a Rhodamine Red-X group, a Texas Red® group, a Cascade Blue® group, a Cascade Yellow group, a Marina Blue® group, a Pacific Blue group, an AMCA-X group, or a coumarin group.

94-95. (Canceled)

96. (Previously presented) A chemical compound having the structure:
fluorophore-LINKER-X-FRRRRK-amide (SEQ ID NO:3);
wherein F is phenylalanine; K is lysine; R is arginine; and X is serine, threonine, or tyrosine, wherein the linker is selected from the group consisting of N-methyl glycine, L-proline, D-proline,



97. (Previously presented) A chemical compound having the structure:
fluorophore-LINKER-X-FRRRRK-amide (SEQ ID NO:3);
wherein F is phenylalanine; K is lysine; R is arginine; and X is serine, threonine, or tyrosine, wherein the linker is selected from the group consisting of the following:



a



b



c



d



e



f



g



h



i



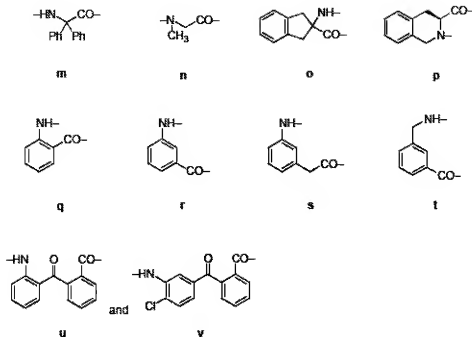
j



k



l



98. (Currently amended) The chemical compound of claim 90, wherein the chemical compound is a substrate for a protein kinase or a precursor for a substrate for a protein kinase.

99. (Original) The chemical compound of claim 98, wherein the chemical compound is specific for protein kinase C.

100. (Original) The chemical compound of claim 99, wherein the chemical compound is specific for isoforms α , β , and γ of protein kinase C.

101. (Original) The chemical compound of claim 98, the chemical compound is

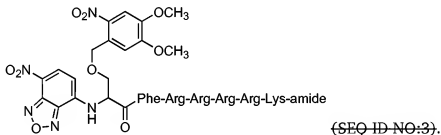
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specific for protein kinase A, protein kinase B, protein kinase D, protein kinase G, Ca⁺/calmodulin-dependent protein kinase, mitogen-activated protein kinase, protein kinase mos, protein kinase raf, protein tyrosine kinase, tyrosine kinase abl, tyrosine kinase src, tyrosine kinase yes, tyrosine kinase fps, tyrosine kinase met, cyclin-dependent protein kinase, or cdc2 kinase.

102. (Original) The chemical compound of claim 90, wherein the chemical compound further comprises a carbohydrate, a lipid or a nucleic acid.

103-121. (Canceled)

122. (Currently amended) A chemical compound comprising SEQ ID NO:3 having the structure



123. (Previously presented) A composition comprising a chemical compound of claim 89, and a carrier.

124-126. (Canceled)

127. (Previously presented) The substrate of claim 60, wherein the substrate

comprises a metal ion chelator.

128. (Original) The substrate of claim 127, wherein the metal ion is a magnesium ion or a calcium ion.

129. (Previously presented) The chemical compound of claim 90, wherein a metal ion chelator induces a change in fluorescence intensity.

130. (Original) The chemical compound of claim 129, wherein the metal ion is a magnesium ion or a calcium ion.

131. (Original) The chemical compound of claim 129, wherein the change in fluorescence intensity is at least a 20% change in fluorescence intensity.

132. (Canceled)

133. (Previously presented) The chemical compound of claim 90, wherein the linker comprises a turn to position the fluorophore in a location closer to the serine, the threonine or the tyrosine than the location the fluorophore would occupy in the absence of a turn in the linker.

134. (Previously presented) The chemical compound of claim 89, wherein the linker comprises a turn to position the fluorophore in a location closer to the terminal serine, the terminal threonine or the terminal tyrosine than the location the fluorophore would occupy in the absence of a turn in the linker.

135-136. (Canceled)

137. (Previously presented) The composition of claim 123, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

138. (Previously presented) A composition comprising the substrate of claim 49, and a carrier.

139. (Previously presented) The composition of claim 138, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

140. (Previously presented) A composition comprising the compound of claim 88, and a carrier.

141. (Previously presented) The composition of claim 140, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

142. (Previously presented) A composition comprising the compound of claim 90, and a carrier.

143. (Previously presented) The composition of claim 142, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

144-145. (Canceled)

146. (Previously presented) A composition comprising the compound of claim 122, and a carrier.

147. (Previously presented) The composition of claim 146, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

148. (Currently amended) ~~The substrate of claim 56,~~

A substrate for a protein kinase or a precursor of the substrate, wherein the substrate or the precursor comprises:

a peptide substrate for the protein kinase, wherein the peptide comprises a serine, a threonine, or a tyrosine on a terminal end of the peptide;

at least one fluorophore, wherein a fluorophore is attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide;

wherein the fluorophore is attached directly to the peptide or the fluorophore is attached to the peptide by a linker selected from the group consisting of

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a



b



c



d



e



f



g



h



i



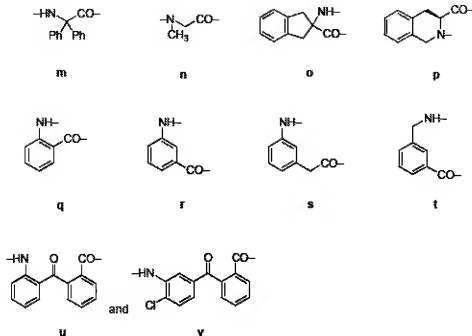
j



k



l



;

wherein a photolabile side chain is attached to the serine, the threonine, or the tyrosine on the terminal end of the peptide, wherein the photolabile side chain blocks transfer of a phosphoryl group from adenosine triphosphate to a hydroxyl moiety of the serine, the threonine, or the tyrosine so that the substrate cannot be phosphorylated by a protein kinase until the photolabile side chain is removed from the substrate.

149. (Previously presented) A composition comprising the substrate of claim 83, and a carrier.

150. (Previously presented) The composition of claim 149, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically

acceptable carrier.

151. (New) A composition comprising the precursor of a substrate for a protein kinase of claim 59, and a carrier.

152. (New) The composition of claim 151, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.

153. (New) A composition comprising the substrate for a protein kinase or a precursor of the substrate of claim 148, and a carrier.

154. (New) The composition of claim 153, wherein the composition is a pharmaceutical composition and the carrier is a pharmaceutically acceptable carrier.